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METROPOLITAN WASHINGTON AIRPORTS POLICY

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Final Environmental Impact Statement

August 1980

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Washington D.C.

TD 4.48:

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

METROPOLITAN WASHINGTON AIRPORTS POLICY

WASHINGTON NATIONAL AIRPORT
DULLES INTERNATIONAL AIRPORT

METROPOLITAN WASHINGTON AREA
WASHINGTON, D.C.

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FINAL ENVIRONMENTAL IMPACT STATEMENT
Pursuant to Section 102(2)(C)
of the National Environmental Policy Act
of 1969, 42 U.S.C. 4332(2)(C)

The Final Environmental Impact Statement (FEIS) presents the environmental findings associated with a range of five policy alternatives to guide Washington National and Dulles International Airports in serving the air transportation needs of the Nation's Capital. A policy will be selected from within the range of alternatives presented in this FEIS. The policy will set forth the manner in which each of the two facilities is to contribute to meeting the overall aviation needs of the Metropolitan Washington area.

No administrative action will be taken to implement a Metropolitan Washington Airports Policy for a period of at least 30 days from the date of availability of the FEIS and the policy selected by the Secretary of Transportation as published by the United States Environmental Protection Agency.

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Washington, D.C. 20402

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SECTION I: SUMMARY

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

Metropolitan Washington Airports
Final Environmental Impact Statement

Metropolitan Washington Airports
Policy Statement

August 1980

This final environmental impact statement is submitted for review pursuant to the following public law requirements: Section 102 (2) (C) of the National Environmental Policy Act of 1969, 42 U.S.C. 4332 (2) (C).

Summary

( ) Draft EIS (X) Final EIS

Department of Transportation, Federal Aviation Administration, Charles C. Erhard, Program Planning and Environmental Affairs Officer, Metropolitan Washington Airports, Hangar 9, Washington National Airport, Washington, District of Columbia 20001 (telephone: 703-557-0972).

NAME OF ACTION AND BACKGROUND

( ) Legislative (X) Administrative

The Washington-Baltimore region is served by three air carrier airports, two of which - Washington National and Dulles International Airports - are operated by the Federal Government. The two Federal airports have been operating over the past decade without a formalized, comprehensive policy defining their respective roles and guiding their day-to-day operations. Significant technical, regulatory, and social changes have occurred over this period of time along with the recognition of some significant facility and environmental problems that have developed at National Airport.

These problems at National, along with the other changes that have occurred over the past decade, suggest the need for a policy which will guide the two Federal airports in serving the air transportation needs of the Nation's Capital. It is clear that operating, planning, and investment decisions at the two Federal airports cannot logically be made without an underlying policy which sets forth the manner in which each of the two facilities is to contribute to meeting the region's overall aviation needs.

In March 1978, the Department of Transportation (DOT) issued a notice of a proposed policy and a Draft Environmental Impact Statement (DEIS) for Metropolitan Washington Airports. A wide range of policy options were presented in the analysis including an evaluation of 32 policy alternatives. Comments on the policy options were received at public hearings held in May of 1978 and written comments were received from Members of Congress, Federal agencies, state, municipal and local agencies, public and private organizations, and from interested individuals.

The comments revealed sharp differences of opinion on a policy for the two Federal airports. Many of the county and municipal governments of the Metropolitan Washington area along with local citizens expressed the strong view that, with two other air carrier airports available in the region, the concentration of air carrier activity at National is an unwarranted and unnecessary burden on the airport neighbors who are subject to the impacts of aircraft noise. Other interests, many of which are outside the Washington area, expressed an equally strong national view and believe National's uniquely convenient location should be made available to air travelers who want direct access to downtown Washington. Those supporting this national interest argue that Washington National, as a Federally owned and operated airport serving the Nation's Capital, necessarily performs more of a national role than a local one.

The DOT then elected to modify the 1978 policy proposal and to issue a supplement to the draft environmental impact statement to permit further public input prior to making a final policy decision. The supplement to the DEIS was issued in January 1980. Public hearings were conducted in March 1980.

The testimony received at these hearings, together with comments received at the local, State, and national level, continued to focus on the prior positions expressed by local and national interests. In response to the comments received on the Supplement to the DEIS, further fine tuning of alternatives was conducted. This Final EIS contains five policy alternatives.

POLICY ALTERNATIVES

Within the Final Environmental Impact Statement (FEIS), five alternative policies for the operation of the Metropolitan-Washington Airports have been analyzed. These five alternatives cover the range of options available from a significant reduction in activity at National to an expanded role for the airport. Included in the alternatives is consideration of the consequence of making no change in the current operating practice at National.

These alternatives were revised and expanded as a result of continued FAA study and input received from various Federal, State, and local agencies, community groups, the aviation industry, and the general public. The alternatives considered in this FEIS are:

* No Policy Change (Base Case)

* Expanded Growth Policy at National

* Controlled Growth Policy to 18 Million Passengers at National

* Controlled Growth Policy to 16 Million Passengers at National

* Reduced Activity Policy at National

Expanded Growth Policy at National embodies many of the policy provisions recommended by the airline industry and interests from across the country that desire expanded utilization of National Airport. This alternative would increase existing noise impacts at National and would also provide the highest level of air service into National.

The Reduced Activity Policy at National embodies many of the policy provisions recommended by the local governments and many of the citizens of the Washington area. This alternative would decrease existing noise impacts at National more than any other alternative and would result in the lowest level of air service into National.

The Controlled Growth to 18 and 16 Million Passengers at National alternatives place restrictions on National Airport with resulting noise and air service impacts falling within the range set by the Expanded Growth and Reduced Activity alternatives.

The No Policy Change alternative represents the base case against which each of the alternatives can be compared, and reflects the continuation of existing operating practices.

ENVIRONMENTAL CONSEQUENCES

The environmental impacts associated with each of these alternatives have been evaluated and presented in this FEIS. In addition, measures which would be taken to mitigate adverse environmental consequences have also been incorporated in each of the policy alternatives.

The following presents a brief summary of the range of impacts which would result from the five alternatives in each of the major environmental categories.

The analysis of noise impacts indicated that, at National, all of the policy alternatives would result in less noise exposure when compared to the No Policy Change alternative. Analysis of the remaining alternatives indicates that the cumulative noise impacts are greatest with the Expanded Growth case and least with the Reduced Activity alternative. Population living within the 30 NEF contour for each airport and the region as a total under each policy alternative is as follows for 1990:

	National	Dulles	BWI	Regional Total
Existing 1979	75,000	4,500	30,000	109,500
No Policy Change 1990	116,000	3,500	22,900	142,400
Expanded Growth 1990	82,000	3,700	22,900	108,600
Controlled Growth 18 Million 1990	24,000	5,100	23,500	52,600
Controlled Growth 16 Million 1990	21,000	5,200	24,100	50,300
Reduced Activity 1990	1,200	6,000	25,700	32,900

The air quality analysis indicated that present violations of the Carbon Monoxide (CO) standard at National would be eliminated under all alternatives with the exception of one receptor point under the Expanded Growth alternative and No Policy Change alternative. The lowest concentration of pollutants at National would result from the Reduced Activity alternative. CO emissions at Dulles would be within standards under all alternatives. In terms of regional Hydrocarbon (HC) emissions, which represent the key element in the establishment of ozone, the Reduced Activity alternative results in the greatest total load of HC emissions. This results largely from the amount of diverted surface vehicular traffic which occurs with the Reduced Activity alternative and is of significance due to Washington's existing regional ozone problems.

From an energy standpoint those alternatives which allow for a mix of the new generation of aircraft (widebodies for example) provide the flexibility to schedule aircraft equipment which would most efficiently handle the traffic. In addition, to avoid excess surface traffic fuel consumption, those alternatives which maximize passengers at National are most desirable.

With respect to parks and historic sites, it should be noted that any policy alternative which would not change or would reduce noise exposure on parklands and historic sites would not be considered to require Section 4 (f) involvement. Essentially, the action of reducing existing impacts will not be considered a taking of parklands. Three of the policy alternatives, Controlled Growth to 18 Million at National, Controlled Growth to 16 Million at National, and Reduced Activity at National, all result in measurable reductions in noise exposure on parklands and historic sites.

The effect on local economic activity is largely related to the number of passengers passing through each airport. Thus, the Expanded Growth alternative at National maximizes the economic benefits in the vicinity of National and the Reduced Activity alternative at National minimizes these benefits. The converse is of course true at Dulles and Baltimore-Washington.

In terms of Airline Service, the Expanded Growth alternative would provide the most flexibility to the airlines and would result in the maximization of service to National. The Controlled Growth alternative at National to 18 million or 16 million passengers would limit the ability to expand service at National, however, these alternatives should not significantly reduce the quality of airline service at National or within the region. The Reduced Activity alternative, which would result in over a 50 percent reduction in aircraft operations at National within 4 years, would reduce or eliminate service from National to a large number of cities. In addition, the Reduced Activity alternative would have a significant adverse short term impact on terminal and parking capacity at Dulles.

AREAS OF CONTROVERSY AND ISSUES TO BE RESOLVED

The primary area of controversy with the Metropolitan Washington Airports policy effort centers about the conflicting and competing interests that have historically influenced the two Federal airports. Many of the local governments and citizens in the Washington area favor the Reduced Activity alternative because of their primary concern of reducing the impacts of aircraft noise. Many interests from across the country, including the aviation industry, favor the Expanded Growth Policy alternative because of their primary interest in expanding the quality of air service into National, the close-in airport to the Nation's Capital.

Clearly, this controversy can only be resolved by the policy selection of the Secretary of Transportation.

The Environmental Protection Agency has raised concerns regarding air quality and noise impacts at National. Some of the policy alternatives under consideration measurably reduce these impacts. The policy selected could resolve these concerns.

The Department of the Interior (DOI) has raised concerns regarding the impacts on parklands and historic sites. Some of the policy alternatives under consideration reduce existing impacts on parklands and historic sites. However, DOI's concerns possibly may not be completely satisfied or resolved, even with a policy selection that reduces impacts on parklands and historic sites.

POLICY DECISION

This FEIS presents the range of policy alternatives under consideration by the Secretary of Transportation. A policy for Metropolitan Washington Airports will be selected from within the range of these alternatives. The FEIS does not designate a preferred policy alternative. Therefore, the reader will need to review the published policy selected by the Secretary along with the FEIS. All parties receiving the FEIS will receive the document outlining the selected policy.

Statement Was Made Available to EPA and the Public on:

August 15, 1980

8/15/80

JAMES A. WILDING
Director, Metropolitan Washington
Airports

Date

THE ENVIRONMENTAL CONSEQUENCES OF THE METROPOLITAN WASHINGTON AIRPORTS (MWA) POLICY SELECTED BY THE SECRETARY OF TRANSPORTATION CAN BE DETERMINED BY OBSERVING THE MID-RANGE VALUES IN ALL IMPACT CATEGORIES BETWEEN THE CONTROLLED GROWTH POLICY TO 18 MILLION PASSENGERS AND THE CONTROLLED GROWTH POLICY TO 16 MILLION PASSENGERS. THE MWA POLICY IS IDENTICAL TO THESE CONTROLLED GROWTH POLICIES EXCEPT THAT IT EMPLOYS A 17 MILLION PASSENGER CAP.

THE SECRETARY OF TRANSPORTATION
WASHINGTON, D.C. 20590

METROPOLITAN WASHINGTON AIRPORTS POLICY

Introduction

Washington National Airport is unique among the Nation's airports. One of only two air carrier airports operated by the federal government, it serves as the principal air gateway to the Capital. Its location immediately across the Potomac from Washington makes it one of the most convenient airports in the Nation, and at present it has better mass transportation access than the other two airports serving the metropolitan area. To those who live in its flight paths, however, it is at best an unwelcome neighbor. Despite runway limitations, National is one of the busiest airports in the national system. Its more than sixty operations (takeoffs and landings) per hour, of which forty are by certificated air carriers, mean a constant noise impact through the day and early hours of the night.

National currently operates under stricter conditions than any other air carrier airport. Four-engine jets, the noisiest in the air carrier fleets, are prohibited. By regulation, scheduled air carrier operations are limited to 40 per hour. By informal agreement, carriers do not schedule flights between 10 p.m. and 7 a.m., and general aviation jets generally do not operate after 11 p.m. Widebody jet aircraft are also prohibited. The Federal Aviation Administration (FAA), the Airport's operator, has adopted special flight procedures to limit noise impacts on the region. These extraordinary limitations are not, however, sufficient. Most of the Airport's neighbors would like further restrictions on the use of National; some would like to see it closed altogether, with traffic handled at the more remote and underutilized Dulles International Airport, or Baltimore-Washington International.

To many of the Airport users, however, convenience is the paramount issue. The airlines have found that they can achieve higher load factors on flights scheduled at National than at the other metropolitan area airports, chiefly, they contend, because most passengers in the area would prefer to leave from there. Further, passengers not traveling to Washington find the greater number of flights allow for more convenient connections. This divergence of opinion has fueled a continuing debate on the proper use of National.

A coherent policy for the operation of National has never been developed. Its operations are governed by a patchwork of informal rules developed in the sixties, at the time jet aircraft were first introduced. The terminal buildings, except for limited improvements made by the airlines, for the most part date back to the days of propeller-driven aircraft. Proper development of the Airport facilities has been delayed pending resolution of its future use. Repeated efforts to decide what to do about National, whether to expand it, rebuild it, or sell or transfer it to a local authority, have never come to fruition. As a result, almost no improvements have been made. As passenger levels have continued to grow, the terminal has grown increasingly crowded, and the roadways and parking lots serving the Airport are normally congested.

Continuation of the present uncontrolled operating conditions is intolerable. On this point, most proponents and opponents of increased use of National are in agreement. Further, whether more or less air traffic is served by National in the future, the physical plant must be improved. Before such improvements can be undertaken, however, the future role of the Airport must be established. No matter what policy is selected, continued unrestricted growth in passengers served cannot be permitted in the future. It would be impossible, as a practical matter, to accommodate all the potential demand at National, and the environmental impacts of attempting to do so would be unacceptable. Thus, provision must be made for handling air traffic to Washington at the other two area airports.

When I took office as Secretary of Transportation, the Federal Aviation Administration was in the process of developing a new policy proposal for the operation of its two airports. Convinced that such a policy was long overdue, I made it a personal priority. In September, we advised the U.S. district court that had ordered an environmental impact statement prepared on the operations of National that we would produce the required statement by August 15, 1980. In January, our proposed policy was published for public comment; hearings were conducted in March. In addition to the hearing transcripts, over 500 written comments were submitted to the public docket. In June, the House Committee on Public Works and Transportation held oversight hearings. After exhaustive review of the record and extensive consultation with the Federal Aviation Administrator, I have decided on an operating policy for the Metropolitan Washington Airports.

Summary of the Policy

In brief, after January 1, 1981, operations at Washington National and Dulles International Airports will be conducted under the following principles. The FAA is issuing final rules that incorporate the principal elements of the Policy.

1. PASSENGER CEILING (Cap)

National Airport will not be permitted to accommodate more than 17 million total passengers per year. That level will be maintained by periodically adjusting the numbers of "slots", or rights to schedule landings or takeoffs, that are available to certificated and commuter air carriers. The FAA expects the ceiling to be reached in 1983.

2. OPERATING RIGHTS (Slots)

The total number of slots at National will remain at 60 per hour, as provided in the current High Density Rule. The portion of that total available to certificated air carriers will be reduced to 36 per hour, a reduction of four from the current allowance of 40. The air taxi allowance will be increased from the current eight per hour to 12 per hour, and the category of carrier entitled to use them will be changed to "commuter". The current allowance of 12 per hour for general aviation activity will remain unchanged.

The hourly scheduling limitations will be in force each day between the hours of 7:00 a.m. and 8:59 p.m. Between 9:00 p.m. and 9:30 p.m., each of the three categories of user will be permitted one-half the hourly allowances, 18 slots for certificated air carriers, six for commuter carriers, and six for general aviation.

As a result of the change from "air taxi" to "commuter", certificated air carrier slots will be available only to scheduled carriers using aircraft of 56 or more passengers seats, while commuter slots will be used by all carrier aircraft with fewer than 56 seats. At present, flights by commuter carriers operating on certificated routes count against the air carrier allotment.

3. HOURS OF OPERATION (Scheduling Limitations and Curfew)

Carriers will be permitted to schedule operations, consistent with the hourly slot limitations, only between the hours of 7:00 a.m. and 9:30 p.m.

In addition, a curfew will be imposed to halt late operations. Initially, the hours of operation at National will be modified to prohibit all aircraft departures between the hours of 10:30 p.m. and 7:00 a.m. There will be a similar curfew on all aircraft arrivals between the hours of 11:00 p.m. and 7:00 a.m.

Many commenters urged that, in lieu of closing National to all traffic at night, smaller aircraft that are substantially quieter than jet transports should be permitted to operate past the 10:30 or 11:00 p.m. closing hours. Since the necessary environmental data on this proposal is not available, the FAA will analyze this proposal further. If appropriate, a separate rulemaking will be issued, to be concluded by January 1, 1981.

4. EQUIPMENT LIMITATIONS (Widebodies)

The policy prohibition on the use of 2- and 3-engine widebody aircraft at National will be removed on January 1, 1981. The FAA is satisfied that widebodies can be operated there safely. Each carrier's right to operate this type of equipment will turn on an evaluation of the safety of its operation by the Office of Aviation Standards and a decision by the Director of the Metropolitan Washington Airports that the use of such aircraft is compatible with the Airport's airside and terminal facilities and roadway capabilities.

5. CITIES SERVED (Perimeter Rule)

The nonstop service perimeter for National will be established at 1,000 miles, with no exceptions. This policy would permit airlines to add nonstop service to cities such as Birmingham, Fort Lauderdale, Kansas City, and New Orleans to the more than 50 cities receiving nonstop service under the present system.

6. PHYSICAL DEVELOPMENTS (Master Plan)

The Federal Aviation Administration will immediately undertake to develop, with public participation, a Master Plan for physical redevelopment of National, including improved access to public transportation, and will then proceed with such a redevelopment program.

7. DULLES

Dulles International Airport will continue to provide all types of aviation services to the Washington area at all hours of the day. Capacity at Dulles will continue to be added as necessary. The Dulles Airport Access Highway will continue to serve airport traffic only, with the several exceptions currently in force. Additional access improvements to Dulles, particularly those oriented to public transit modes, will be pursued.

Changes from the Proposed Policy

As a result of public comment and our analysis, two modifications have been made to the Policy as proposed last January:

- The passenger ceiling has been reduced from 18 million to 17 million. The purpose of a ceiling is to limit growth at National, without causing sudden disruption to existing air service patterns. The recent continuing decline in passenger traffic growth will mean that the reduced cap will probably not be reached until approximately 1983.

- The proposed policy set a 10:30 absolute curfew for operations into National. Experience shows that flights scheduled for 9:30 will occasionally arrive after 10:30 p.m. In order to minimize the extreme inefficiency and inconvenience that could be caused by the diversion of late flights to Dulles or Baltimore, the arrival limitation will be extended to 11:00 p.m.

Other Issues

Commenters expressed considerable concern that both the immediate and future reductions in flights at National will exacerbate the present trend of carrier emphasis on the larger markets at the expense of service to smaller communities. National is the primary airport serving the Nation's Capital. As such, it provides access for citizens to their government. We must assure that the limited capacity of National is made available to the public on an equitable basis.

A separate notice of proposed rulemaking will be issued within thirty days on the allocation of slots among carriers. It will contain one or more alternative methods to assure that nonstop service to National is equitably distributed among cities within the perimeter.

A second rulemaking will be issued to establish a mechanism for determining the number of slot reductions required in the future to assure that the number of passengers served at National does not exceed 17 million.

Underlying Considerations

There are two basic reasons that a comprehensive operating policy for the Metropolitan Washington Airports is necessary. First, the future role of National must be established so that the facility can be improved to deal adequately with the traffic it will carry. Second, growth at National must be controlled both so that the adverse environmental impacts of the airport can be limited, and so that congestion can be reduced. This in turn will permit orderly improvements in access to Dulles and Baltimore Washington International.

Existing limitations at National are simply not adequate to deal with the potential for growth. Although the number of flights per hour have been limited, the airlines have been able, through the introduction of larger two- and three-engine aircraft, to increase substantially the number of passengers. The readily observable result has been the continuing ground and terminal congestion passengers and carriers at National must face. The capacity of roadway and parking facilities has long been overwhelmed by growth. Aircraft aprons are undersized and crowded. Even counter space is too limited to handle passenger loads efficiently. The cure to this problem cannot be reconstruction of the terminal alone. National has limited space on which to expand, and there are further limits to the ground transportation network.

Noise impacts on surrounding communities are also severe, even under present operating conditions. National is one of the busiest airports in the nation. Present schedules allow jet transport takeoffs and landings every minute and a half. For the residents of the area that live along the Potomac River flight paths where flight activity is concentrated, the noise levels are already especially offensive because of their perception that the concentration of activity at National is unjustified, given the availability of Dulles and Baltimore.

A policy is also necessary to assure that Dulles is fully utilized. As long as carriers are able to increase the number of passengers carried at National, they will continue to do so. It has been to their advantage to shift longer haul flights formerly scheduled at Dulles to National, at the expense of shorter haul markets traditionally served there.

Another important consideration is the availability of Dulles International and Baltimore-Washington International Airports to serve the metropolitan area. These airports, both open at all hours, are readily accessible to many in the metropolitan area, and do not present environmental problems as serious as National's. As operations are limited at National, passengers will have excellent alternative facilites that, while not as convenient to downtown as National, provide service superior to that at many other cities.

Annual Passenger Limitation

Background

Despite the existing limitation on the number of air carrier operations that may be scheduled per hour at National, the Airport has experienced considerable growth in passengers carried. Passenger activity has increased from approximately 11 million in 1972 to 15 million in 1979 while the number of operations of certificated air carriers actually declined somewhat because of the introduction of larger capacity aircraft. Congested as it may be, National is not yet near the saturation point under the existing policy. Growth trends are expected to return, despite the recent downturn in air traffic. If the present operating conditions were not changed, Washington-area passengers would be distributed in the future as follows:

ANNUAL PASSENGERS
(Millions)

Forecast

Year	National	% Market	Dulles	% Market	Baltimore	% Market
1980	14.8 MAP	67%	3 MAP	16%	3.8 MAP	17%
1985	18.8	64%	4.6	16%	5.8	20%
1990	19.2	51%	9.4	25%	8.9	24%

Note: "MAP" means million annual passengers

The forecast activity shows National continuing to dominate, in terms of the market served, well into this decade and beyond, even assuming, as the above figures do, that widebodies were not allowed there. If widebodies, which seat about 200 to 275 passengers, were permitted to replace the 90 to 150 seat aircraft now serving National, passenger activity would grow even faster. It would be projected to reach 19 million as soon as 1985.

The growth potential is so great that, even with the reduction in operating hours and number of operations per hour proposed in this policy, National passenger traffic could reach substantially the same levels as if these capacity limitations were not adopted. The reduction from 40 to 36 flights per hour would thus only slow the rate of growth, and would not in itself bring about a significant shift in future passenger activity to Dulles or Baltimore.

Initial Proposals

When this policy was published for public comment in January, it proposed a ceiling on growth of 18 million passengers per year to assure that National's growth would be contained.

The environmental impact statement analyzes the impacts of no cap and caps of 18 and 16 MAP, as well as a more restricted alternate that included a 14 MAP cap.

Policy Decision

An annual ceiling of 17 million passengers per year will be adopted for National. This lower limit will probably be reached in 1983, two years sooner than the 18 million proposal. The limit was chosen to set a level that provides an adequate degree of environmental protection without severely disrupting passenger traffic patterns, and the recent downturn in traffic enables this goal to be accomplished with a reduced cap.

The adoption of this cap will enable the FAA to develop plans for the modernization of National facilities and anticipate any necessary improvements at Dulles as well. Other advantages will flow from this provision, however, As the airlines take advantage of the decision to admit widebody aircraft, and as load factors on all aircraft at the Airport increase, fewer and fewer flights will be permitted at National. The FAA estimates that in 1990, as a result of the cap, certificated air carrier slots could be reduced to 30 scheduled operations per hour.

At the same time, the introduction of the quieter widebodies and new design aircraft will mean continuing improvements in the noise impact on National's neighbors.

The more drastic proposal of reducing hourly slots to 20 immediately, eliminating grandfather cities, and setting a cap of 14 million, proposed by the Metropolitan Washington Council of Governments, has been rejected. The disruptive impact on established passenger service would be too extreme, forcing longer distance traffic through already crowded hubs, principally Atlanta and Chicago, and ending service to many smaller communities immediately.

Operating Rights

Background

The present FAA high density rule for National (14 C.F.R. 91.193) was adopted in 1969 and has never been changed. Air carrier operations, the principal source of noise impact on National's neighbors, have been limited to 40 per hour. This limitation no longer provides the same protection it originally did. Over the years, the carriers have increasingly substituted larger, heavier airplanes for the ones they originally flew. Jets have almost completely replaced propeller-driven aircraft. This trend has contributed to increased noise levels and airport congestion.

Over the past several years, commuter air carrier service has grown substantially throughout the Nation. Since enactment of the Airline Deregulation Act of 1978, the commuters' role has become increasingly important as they have moved into markets no longer served by the certificated carriers. At National, however, commuters have been limited to eight slots per hour. The effect of this limit has been somewhat alleviated by Civil Aeronautics Board procedures that permit commuters to operate certificated air carrier routes not being flown by a certificated carrier. This has not been sufficient, however, to meet the potential demand for commuter operations at National.

General aviation has been limited to twelve operations per hour. This provision, however, is not as significant to the users as the two air carrier allotments because slots are actually "IFR" (instrument flight rule) reservations, or the right to operate in weather conditions where visibility is poor enough to require the use of instruments. General aviation aircraft, which do not operate by schedule, are able to operate in greater numbers when visual flight rules apply and reservations are not required. Scheduled carriers, on the other hand, must operate on a schedule and therefore do not schedule more flights than the IFR capacity of the airport.

Initial Proposal

The January policy proposal was to reduce air carrier slots from 40 to 36 per hour, increase commuter slots from eight to 12, and leave general aviation slots unchanged. An alternative proposal would have reduced general aviation slots to nine, and increased commuter slots to 15.

In addition, we proposed to redefine the slot categories. The present commuter slots are reserved for "air taxis", an obsolete category of air carrier. The proposal would reserve commuter slots for aircraft certificated to carry fewer than 56 passengers.

The final environmental impact statement analyzed the impact of our initial proposals, a variable hourly slot proposal, and a reduced activity alternative, which combined a 20 slot per hour limit with a 14 million passenger cap.

Policy Decision

Air carrier slots will be reduced to 36 per hour, commuter slots increased to 12, and the proposed redefinition of slot categories will be adopted. The results will be an immediate reduction in noise and a reduction in the passenger traffic growth rate at National.

There are two basic reasons for reducing certificated air carrier operations from 40 to 36 per hour and increasing the commuter air carriers from eight to 12. First is the need to limit the growth of National and to direct the future growth in activity toward Dulles and Baltimore. The second is to make more slots available to commuter carriers.

Many commenters on the proposed policy alleged that a reduction of four slots would be insignificant and would not contribute measurably to the reduction in use of National Airport. It should be clear that the reduction in air carrier slots is an indication of this Department's resolve to control future growth at National. When added to the cutback in the number of hours and a cap on total passenger activity at the airport, the four slot reduction does have a meaningful impact. The reduction of four scheduled operations per hour will eliminate 64 potential operations by certificated air carriers based on the present operating hours and will immediately slow the rate of growth of National. The combined reduction in operating hours and the reallocation of slots will remove 118 of the existing 640 air carrier operating slots per day, an 18.4 percent reduction. For the next two years airport activity should be below current passenger levels.

Commuter operations could not be increased by simply increasing the total number of IFR reservations per hour. But even though the total limitation has stood since 1969, in spite of advances in air traffic control technology, and installation of the latest equipment in the National control tower, the instrument flight rules condition capacity of the Airport remains approximately 60 operations per hour.

Eight commuter carriers now operate at National. Slots are not made available to new carriers until released by others, and 15 operators are currently waiting to acquire them. The cities that they propose to serve from Washington are the smaller communities within several hundred miles that have only limited, if any service by certificated air carriers. The cities proposed to be served by the carriers on the waiting list include Norfolk, Bridgeport, New Haven, Atlantic City, Lynchburg, and White Plains.

The FAA will address the problem of smaller communities in a future Notice of Proposed Rulemaking on Operating Slot Allocation. Nevertheless, the redistribution of slots to the commuter air carriers will be beneficial to these cities. The redistribution of slots to permit more operations of commuter aircraft is long overdue at National. It will enable commuter air carriers that are available for replacement service to communities that have experienced a loss of certificated air carrier service to obtain the necessary slots for operation at National Airport. In addition, the redistribution of slots permits the quieter commuter aircraft to operate in lieu of larger turbojet aircraft and should result in a noise benefit to the community.

To promote the most efficient use of both air carrier and commuter slots, FAA regulations will require that operations with aircraft having a certificated maximum passenger capacity of fewer than 56 seats, which category includes most commuter aircraft, be conducted with the commuter air carrier slots, even if the carrier is certificated. Commuter air carriers that have acquired a certificate of public convenience and necessity from the Civil Aeronautics Board and are presently using certificated air carrier slots with small aircraft will thus henceforth operate with commuter air carrier slots. This would return approximately 30 slots per day to the certificated air carriers to be operated with aircraft with 56 or more seats. The immediate return of these slots alleviates somewhat the certificated air carriers long-term "losses" from the quota redistribution of 40 to 36.

The policy proposal gave consideration to a further redistribution of slots to increase commuter air carrier slots to 15. These slots would have been deducted from the general aviation allocation of 12 per hour. Supporters of this alternative generally point to our ability to serve more people if these operating slots are allocated to air carriers. Private and corporate aircraft, they contend, contribute to the delay and congestion on the airport, but do not produce a transportation benefit to large numbers of people.

Were it solely the question of adding capacity to National Airport, we might favor this approach. It is not certain, however, that an increase of more than four slots per hour is needed at this time for commuter air carriers. Furthermore, additional slots will be made available to the commuters as the cap on growth results in further slot reductions for certificated carriers.

Industry opponents to slot redistribution, principally the Air Transport Association (ATA), claim that a significant adverse impact on distant communities could result from this Department's proposal to reduce the air carrier slots from 40 per hour to 36 per hour. The ATA, not convinced that the policy as here adopted provides sufficient environmental improvements to justify the "deleterious impact on commercial activity and impingement on public service," formally proposed an alternative it contends produces a more meaningful noise relief and fewer disruptions of the air transport service. At its heart is a flexible and variable allocation of slots that, while maintaining the total of 60 operations per hour, would increase air carrier operations from the present 40 to 44 per hour during the day. During the off-peak hours, including the early morning and late evening hours, air carrier slots would be reduced below the present 40 to either 36 or 34 operations per hour. There would be a corresponding adjustment in either commuter or general aviation slots to maintain the total of 60 operations per hour. In addition, ATA urged reduced quotas for Saturdays and for Sunday mornings. Its proposal would also permit scheduling up to 9:59, with no more than 36 operations between 9:00 and 9:59, and 18 operations between 9:30 and 9:59.

We have rejected the ATA proposal. An analysis of the recommended variable slot proposal indicates that it will not produce a significant environmental benefit compared to present day operations. The environmental impact statement indicates that in 1990 there will be 82,000 persons residing in the NEF-30 zone, an increase over existing conditions. This is to be compared to 21,000 to 24,000 persons under the policy adopted. The ATA has offered to take slot reductions in hours where the carriers have not experienced much demand. With the exception of the slots at 10 p.m. the carriers would be giving up slots that are not used. The following table illustrates the situation with respect to Sunday slots:

Sunday Air Carrier Slots
(July 1980)

	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10
Currently Available	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Currently Used on Sundays	15	21	31	36	30	30	33	38	38	39	38	35	37	39	40	20
Proposed by ATA	28	34	34	36	36	36	36	44	44	44	44	44	44	44	36	0

In contrast, the four slots per hour added during the peak hours would most certainly be used. As a result, FAA forecasts that under the ATA proposal, which does not include a cap on growth, National Airport would by 1985 handle more than 19 MAP out of a regional total of 29 MAP. With this unrestricted growth approach, National Airport would continue to serve well over 50% of the region's air passengers after 1990. This is inconsistent with the basic objectives of our policy.
In sum, the ATA's proposal does not include a nighttime closing, would permit aircraft operations to be scheduled up to 10 p.m. and to be completed thereafter, and would not impose a cap on total annual passengers at National Airport. Viewed in its entirety, this alternative does not offer environmental improvement when compared to the adopted policy.

Hours of Operation

Background

Since the introduction of air carrier turbojets in 1966, National Airport has been operating under a voluntary arrangement with the air carriers and other airport users to ensure that late night hours remain relatively free of jet operations. These voluntary arrangements include an agreement by the airlines not to schedule jet aircraft operations after 10:00 p.m. and before 7:00 a.m. General aviation operators are asked not to operate jet aircraft after 11:00 p.m. and before 7:00 a.m. As a result of these voluntary restrictions, there has been relatively little activity at National Airport during the late night hours. Over a 24-hour day, 95 per cent of all operations occur between the hours of 7:00 a.m. and 10:30 p.m. Late night operations consist mainly of scheduled air carrier operations that are late because of mechanical or weather delays, and general aviation propeller-driven aircraft.

Although the airlines do not schedule operations after 10:00 p.m., 20 to 25 flights are normally scheduled right at 10:00 p.m., which technically counts as a full hour, since scheduling hours for the rest of the day run for 60 minutes, from :00 to :59. On many nights it takes until 10:30 p.m., and often later, to complete scheduled turbojet operations at National. Thus, while in a statistical sense the late night hours are relatively free of intrusive aircraft operations, operations after 10:00 p.m. and those during the very early morning hours are highly intrusive upon the community. The voluntary nature of the 10:00 p.m. scheduling cutoff has bred inconsistent adherence by the carriers and confusion and misunderstanding within the community. Many airport neighbors think the 10:00 p.m. voluntary scheduling limit is an absolute operating curfew that the FAA is choosing not to enforce. In fact, the scheduling restriction is not regulatory and FAA cannot enforce it.

Initial Proposal

The policy proposal in January was to prohibit the scheduling of commercial flights after 9:30 p.m. and before 7:00 a.m. Late flights would have been permitted to take off or land until 10:30 p.m., after which the Airport would have been closed to all traffic.

The environmental impact statement analyzed alternative policies that included the current situation, the 9:30 limit, and a 9:59 limit, with rights to continue all scheduled flights until completed.

Policy Decision

With the availability of the other two major airports in the region, the community surrounding National can be spared disruptive aircraft noise during the nighttime hours without severly hampering access to the metropolitan area. The policy therefore prohibits the air carriers and commuter airlines from scheduling activities after 9:30 p.m. Further nighttime restrictions will apply to all flight activity at National. Operations may not commence before 7:00 a.m. Initially, all aircraft will be required to depart by 10:30 p.m. and arrive by 11:00 p.m.

In response to comments, we are prepared to consider, in a separate supplemental rulemaking, whether relatively quiet, smaller aircraft should have to cease operations at these hours or whether there is a noise threshold below which they could operate during the nighttime hours without an appreciable problem to the community, particularly in light of the relatively infrequent nature of this type of activity. Many commenters on the proposal have urged adoption of such a rule, but since it was not part of our January policy proposal, it cannot be adopted on the basis of the present record. Moreover, the environmental impact statement prepared with respect to this policy does not provide sufficient technical data to evaluate such a rule.

The FAA will therefore undertake additional analysis in a supplemental EIS to determine if a noise level cutoff could be adopted that would permit some smaller aircraft to operate without imposing a significant noise burden upon the community. That analysis will be completed and, if appropriate, a rulemaking will be undertaken. Any final rule will be issued to be effective on January 1, 1981, concurrent with the rest of the policy.

The adoption of a complete curfew on air carrier operations will eliminate much of the confusion and misunderstanding about the scheduling and operation of air carrier aircraft, particularly when coupled with the 9:30 p.m. scheduling cutoff. The current practice of concentrating flights at the end of the day by scheduling 40 air carrier flights from 9 p.m. to 9:59 p.m. and 20 flights at 10 p.m. produces approximately 60 flights in 61 minutes. Under the policy here adopted, the air carriers will be permitted to schedule 36 flights per hour until 8:59 p.m. and 18 flights from 9 p.m. to 9:30 p.m. This will permit 54 flights over a 91-minute period. This eliminates the concentration of scheduled flights at the end of the day and consequent spillover.

The curfew on departing aircraft will take effect at 10:30 p.m. Arrivals will be permitted to occur until 11:00 p.m. On the basis of public comments and experience, the FAA has concluded that flights scheduled to arrive by 9:30 will on occasion reach Washington as late as 11:00 as a result of mechanical or weather delays. With only 18 certificated carrier arrivals or departures scheduled to occur between 9:00 p.m. and 9:30 p.m., in all but the most unusual circumstances, these operations will be completed before 10:00 p.m.

Widebody Aircraft

Background

Under the informal arrangements reached in the sixties, four-engine jet aircraft, then and now the noisiest available, were not to be used at National. As widebody aircraft were introduced into service, they were not scheduled at National, principally because of their capacity. Such aircraft are in fact quieter than the jets now serving National. Many of the gates at the Airport could not handle them, and other facilities are not adequate to deal with the substantial number of passengers they carry. When the widebodies were new, there were also unanswered questions about how they would mix with other traffic at an airport as busy as National. These questions have since been resolved.

Initial Proposal

The policy proposal was to admit two and three engine widebodies at National when the FAA was satisfied that they could operate safely at the airport and that they would not unduly interfere with ground traffic. The final environmental impact statement analyzed alternatives both with and without widebodies.

Policy Decision

Air carriers will be permitted to operate both two- and three-engine widebody aircraft at National Airport. The FAA Office of Aviation Standards has considered all safety questions raised by widebody operations at National, including operation of this type aircraft with the Airport's existing traffic mix. It has concluded that the operation of these aircraft types can be accomplished safely at National. Before an individual air carrier is permitted to operate a widebody aircraft there, however, the carrier must meet two tests. First, it must satisfy the Office of Aviation Standards that the manner in which the carrier proposes to operate each type of widebody aircraft is safe.

Second, the Director of the Metropolitan Washington Airports must grant access. This decision on individual carrier's applications will be made after an evaluation of the carrier's proposed operating plan and will be based on the proposed operation's compatibility with the airport facility. This condition is necessary because high capacity widebody aircraft can strain the ground-side capabilities of the Airport. It would not be in the best interests of air travellers to permit widebody aircraft to operate where the result would be further overcrowding of the terminal, roadways, and parking areas.

Aside from safety and compatibility with the facility, the principal concern expressed by commenters has been the effect on passenger activity at National. With few exceptions, the existing narrow-body aircraft carry no more than 125 passengers per operation. Widebody aircraft carry between 200 and 275 persons per operation, and are expected by many to fuel the excessive use and growth of National. Many commenters while recognizing the efficiency and environmental benefits, have advocated that each widebody operation be permitted only in exchange for cancellation of two or more narrow-body operations. Such a requirement would be a strong, perhaps complete disincentive to their use and to the noise benefits they will provide. In many cases, a carrier would prefer to provide a greater frequency of service than more seats. Some widebodies, particularly the smaller ones that would fit more easily at National, would provide fewer than twice the seats of the aircraft they would replace.

The answer to these concerns is the 17 million annual passenger cap. As widebodies are introduced and passenger demand grows, the number of slots available to the carriers will be reduced. Widebodies will also permit the larger markets to be served more efficiently, leaving slots available for service to smaller communities.

Nonstop Perimeter

Background

At the time restrictions were first placed on National, basic service patterns were essentially frozen by the informal adoption of a perimeter for the scheduling of nonstop service. The basic agreement, between the ten scheduled airlines serving National at the time and filed with the Civil Aeronautics Board, expired in 1967, but has been observed by the carriers ever since. Nonstop flights may serve any point within 650 miles of National, plus seven "grandfather" cities: Minneapolis, St. Louis, Memphis, Orlando, Miami, Tampa, and West Palm Beach. While this arrangement has preserved the short- and medium-haul nature of service at National, it has engendered continuing complaints from cities not receiving nonstop service.

Initial Proposal

The policy proposal was either to codify the present arrangement in a regulation, or establish a perimeter rule of 1000 miles, a distance that would retain service to all cities presently served and provide all cities equally distant from National with nonstop access.

The final environmental impact statement analyzed the impact of the 1000-mile perimeter, the existing practice, and a 650-mile perimeter without grandfather cities.

Policy Decision

The new perimeter rule will provide for equal access to all cities within 1000 miles. We anticipate that the carriers will provide nonstop service to four new cities in addition to the approximately 55 presently so served: Birmingham, Fort Lauderdale, Kansas City, and New Orleans.

After 14 years, the existing perimeter agreement, by freezing the status quo, has created the perception of inequity for cities outside the perimeter but closer than the grandfather cities. It is a matter of fairness that they be given a chance to have service similar to similarly situated communities. Conversely, there is no rational basis on which the current rule with its exceptions can be defended.

Commenters had two principal reactions to the perimeter proposal. Some feared that the introduction of new cities with nonstop service would cause further growth at National. The reduction in air carrier slots per hour, the scheduling limitations, and the 17 million passenger cap will all prevent such a development. Moreover, many passengers to the new cities served are already using one-stop flights out of National.

Several cities in the western states urged that the perimeter be eliminated and that market forces be permitted to determine what cities receive nonstop service. They argued that such an approach would be more consistent with the principles of deregulation of the airlines. These arguments have been rejected.

First, deregulation principles do not apply here, where a single airport proprietor provides unlimited access to a city through two airports, and a third unlimited access airport is available as well. It would make as much sense to insist that all three New York airports handle international flights. But more importantly, the elimination of a perimeter would have a crippling impact on Dulles Airport in the short term. To the extent they could, carriers would schedule long-haul trips out of National, since those are generally more profitable. National would then serve a larger proportion of high-density markets, and the reduction in service to many of the cities it presently serves could be especially severe.

The Metropolitan Washington Council of Governments and some local citizens groups urged a 650-mile perimeter with no grandfather cities. This alternative is neither necessary nor prudent. It would do nothing to improve the environmental impacts of service at National; cities within that perimeter could readily use all slots available to them. Except for long-haul routes, which in taking off with full loads of fuel climb more slowly and therefore cause more noise impact on the ground, there are virtually no environmental differences between flights to different destinations. Moreover, elimination of the grandfather cities would cause substantial disruption to long-established travel patterns. Several of the grandfather cities are important hubs for connections to points further west. If they were to lose service, passengers would be forced to connect at the already overcrowded Chicago and Atlanta airports.

Another set of commenters, chiefly the airlines serving smaller communities, alleged that extension of the perimeter might force them to give up that service in favor of more profitable markets. The point at which economic pressures lead them to take such action will not depend on the perimeter rule alone. Whatever policy were adopted for National, even no policy at all, would in time prevent carriers from scheduling all the flights they might desire there. The critical element in determining what cities may receive service will continue to be the slot allocation method employed to distribute the limited number of operating rights available at National. Alternative slot allocation methods will be addressed in a separate rulemaking to be published within the next month. It will include one or more possible alternative devices to assure that nonstop service to National is equitably distributed.

Dulles International Airport

Dulles International Airport has the capacity to service all types of aviation: certificated air carriers, commuter air carriers, corporate and pleasure aircraft operators. Its runways are adequate for all types of aircraft, from single-engine piston to supersonic transports. The FAA will ensure that Dulles will remain open to all users so that the Metropolitan Washington area will have complete access to the air transportation system at all times.

Airfield capacity is not now and will not for many years be a problem at Dulles. Its problems are related to terminal capacity and surface transportation access. Dulles, though lightly used most of the day, endures a pronounced peak in activity between 4:00 and 8:00 p.m. During this time almost half of all Dulles's air carrier flights are scheduled, producing overcrowding in the terminal and parking lot, and a reduction in the level of service to airport patrons. A substantial increase in the activity at Dulles will require terminal improvements in passenger holding areas, baggage handling systems and the parking lot. The FAA has already started on the terminal improvements: the domestic passenger hold room and baggage handling areas are being expanded. The flight inspection and baggage claim area for international arrivals has already been modernized and expanded. FAA plans a total expenditure of $10.7 million in capacity-related improvements at Dulles in the near future.

Surface transportation issues are not as near a resolution. As a number of commenters have pointed out, it takes approximately 40 minutes longer to travel the 26 miles from downtown Washington to Dulles than the five miles to National. Many believe that the total trip time precludes all but the travelers from nearby suburbs from commuting from Washington and back in a single day. Many commenters on both sides of the National Airport restrictions issues believe that high-speed ground transportation between Dulles and downtown is necessary in order to make Dulles more attractive and competitive with National.

The median of the Dulles Airport Access Road was designed for the future construction of rapid rail transit. It will be made available to the Washington Metropolitan Transit Authority (Metro) without cost if a decision to build rail rapid transit is reached. Because of construction costs and potentially high operating costs, such a project needs further study. The Urban Mass Transportation Administration, the FAA, and local governments will study these issues. In the meantime, the FAA will work to improve existing bus service to and from downtown. There is also existing van service between the Airport and many points in suburban Virginia and Maryland. At present the travel time to a midtown hotel via an airport bus is about 50-60 minutes. Service is provided by a private company under a concession contract with airport management. FAA is now considering ways to improve that service.

We need not delay stressing greater use of Dulles before rapid rail transit is available. Even with rapid mass transit to Dulles, National Airport will always be more convenient to downtown Washington. If access time alone were to dictate this policy, the emphasis on increased use of Dulles Airport would not, indeed, could not, be nearly as great.

However, convenience of access is but one of the competing factors to be reconciled by this decision. The policy is intended to direct the forecast growth away from National Airport. National's neighbors will pay a significant price in terms of environmental impact if future activity is not redirected,and airport congestion and service deterioration will continue. In view of this alternative the travel time to Dulles from downtown Washington is reasonable, particularly if improved in the future.

A further improvement in ground transportation travel time will result from the completion of the final section of the Dulles Access Highway to connect up with Interstate 66. This road will eliminate the need for much of the airport traffic to take the heavily traveled routes used today. Savings from ten to 15 minutes in peak hours can be achieved by using this road. I am requesting FAA to place the completion of the final section of the Access Highway among its highest priorities.

Furthermore, population data shows that there are many persons who find Dulles as convenient or more convenient than National. Fairfax County, Virginia, had the fastest population growth rate of any jurisdiction in Metropolitan Washington in the past decade. The population forecasts released by the Metropolitan Washington Council of Governments (COG) show that Fairfax will have grown from approximately 250,000 persons in 1960 to more than 700,000 in 1985. By mid-decade, Fairfax County will be the most populous jurisdiction in the area, exceeding even the population of the District of Columbia. If the population trend continues, Fairfax will have a population of over 1,000,000 in 20 years. The neighboring jurisdictions of Montgomery County, Maryland and Loudoun and Prince William Counties, Virginia, are also experiencing rapid growth, whereas the District of Columbia, Arlington and Alexandria, Virginia, are not forecast to experience significant new growth. With regard to employment, COG forecasts that, while the District of Columbia will remain the employment center of the region, Fairfax County will add nearly 100,000 jobs by 1990 for a total of 300,000 jobs in the country. These population data and trends indicate that Dulles Airport could be the preference of more and more potential air travelers including business travelers. A markedly different air service pattern at Dulles will emerge as that market is developed.

For the reasons expressed above, the Department stands fully committed to improving and promoting the use of Dulles Airport.

STATUS OF THE POLICY

This Policy Statement also constitutes a proposed record of decision under the Council on Environmental Quality regulations implementing the National Environmental Policy Act. As such, it will be filed with the Environmental Protection Agency today as part of the final environmental impact statement (EIS). The decisions set forth in it will be embodied in final rules to be published in the Federal Register and will take effect subsequent to a 30 day review period for the EIS. Since the regulations will not become effective until January 1, 1981, no final action will be taken during the regulatory waiting period. Any environmental objections to the proposed action should be addressed to the regulatory docket, which will be kept open for that purpose. The address is:

Docket Clerk
Office of the Chief Counsel, AGC-204
Federal Aviation Administration
Washington, D.C. 20591

August 15, 1980

Neil Goldschmidt

LIST OF AGENCIES, ORGANIZATIONS AND PERSONS TO WHOM COPIES OF THE STATEMENT ARE SENT

FEDERAL AGENCIES

Environmental Protection Agency
Department of the Interior
U.S. Postal Service
Department of the Air Force

STATE AGENCIES

- Commonwealth of Virginia
    - Council on the Environment
    - Department of Aviation
    - Department of Highways and Transportation
- District of Columbia
    - Administration for Planning and Development
- State of Maryland
    - Department of State Planning
    - Department of Transportation
- West Virginia
    - Aeronautics Commission
- Indiana
    - Aeronautics Commission
- Michigan
    - Aeronautics Commission
- South Carolina
    - State Budget and Control Board
    - Office of Lt. Governor
- North Carolina
    - Department of Transportation
- New York
    - Department of Transportation
- Arizona
    - Department of Transportation

CITIES, COUNTIES AND REGIONAL AGENCIES

Metropolitan Washington Council of Governments
Northern Virginia Planning District Commission
Washington Metropolitan Area Transit Authority
National Capital Planning Commission
Fairfax County, Virginia
Montgomery County, Maryland
Prince Georges County, Maryland
Loudoun County, Virginia
Arlington County, Virginia
Westchester County, New York
Broward County, Florida
Dade County, Florida
City of Alexandria, Virginia
City of St. Paul, Minnesota

LIST OF AGENCIES, ORGANIZATIONS AND PERSONS TO WHOM COPIES OF THE STATEMENT ARE SENT (CONT)

City of Fort Lauderdale, Florida
City of Miami, Florida
City of Montgomery, Alabama
City of Birmingham, Alabama
City of New Orleans, Louisiana
City of Houston, Texas
City of Chattanooga, Tennessee
City of Charleston, South Carolina
City of Jackson, Mississippi
City of Kansas City, Missouri
City of Portland, Maine
City of Augusta, Georgia
City of Seattle, Washington

PUBLIC AND PRIVATE ORGANIZATIONS

- Air Carriers Serving the Washington/Baltimore Region
  - American
  - Braniff
  - Delta
  - Eastern
  - Midway
  - Northwest
  - Ozark
  - Pan American
  - Piedmont
  - Republic
  - World Airways
  - Texas International
  - Transworld
  - U.S. Air
  - United
  - Western
  - Air Florida
  - Continental
  - Air France
  - British Airways
  - Aeroflot
- Commuter Carriers
  - Aero-Mech, Inc.
  - Altair Airlines, Inc.
  - Commuter Airlines, Inc.
  - Cumberland Airlines
  - Empire Airlines
  - Hensen Aviation, Inc.
  - Mid-South Commuter Airlines
  - New Haven Airways
  - Ocean Airways, Inc.
  - Pennsylvania Commuter Airlines

LIST OF AGENCIES, ORGANIZATIONS AND PERSONS TO WHOM COPIES OF THE STATEMENT ARE SENT (CONT)

- Ransome Air, Inc.
- Air Vectors Airways
- Cardinal/Air Virginia
- Colgan Airways

Committee for National
Committee for Dulles
Air Transport Association of America
Airline Pilots Association
Commuter Airline Association of America
National Business Aircraft Association
General Aviation Manufacturers Association
Aircraft Owners and Pilots Association
Aviation Consumer Action Project
Montgomery (Alabama) Airport Authority
Huntsville/Madison County (Alabama) Airport Authority
Bangor (Maine) International Airport
Louisville and Jefferson County (Kentucky) Air Board
Columbus (Georgia) Airport Commission
Fayetteville (North Carolina) Airport Commission
Charleston County (South Carolina) Aviation Authority
Syracuse (New York) Hancock International Airport
Toledo-Lucas County (Ohio) Port Authority
Columbia (South Carolina) Metropolitan Airport
Greensboro-High Point (North Carolina) Airport Authority
Lexington-Fayette (Kentucky) Urban County Airport Board
Charlottesville-Albemarle (Virginia) Airport
Airport Commission of Forsyth County (North Carolina)
Atlanta (Georgia) International Airport
Wicomico County (Maryland) Airport Commission
Central West Virginia Regional Airport Authority
Metropolitan Knoxville (Tennessee) Airport Authority
Monroe (Louisiana) Regional Airport
Tri-State
Metropolitan Nashville (Tennessee) Airport Authority
Rapids Parish (Louisiana) Airport Authority
Norfolk (Virginia) Port and Industrial Authority
Lehigh-Northampton (Pennsylvania) Airport Authority
Greater Lexington (Kentucky) Area Chamber of Commerce
The Chamber/New Orleans and River District (Louisiana)
Saint Paul (Minnesota) Area Chamber of Commerce
The Metropolitan Washington Coalition on Airport Problems
Virginians for Dulles
Civic Association of Hollin Hills
Committee of 100 on the Federal City
Arlington County Civic Federation
South Potomac (Maryland) Citizens Association
Mount Vernon Council of Citizen Associations
Waynewood Citizens' Association
Villamay Community Association

LIST OF AGENCIES, ORGANIZATIONS AND PERSONS TO WHOM COPIES OF THE STATEMENT ARE SENT (CONT)

The Foggy Bottom Association
The Moyaone Association
Citizens Coordinating Committee of Friendship Heights, Maryland
Potomac Valley League
Northeast Alexandria Citizens' Association
The Citizens Association of Georgetown
Marlin Forest Citizens' Association
Potomac Valley-Riverbend Civic Association
River Falls Civic Association
Parkway Citizens' Association
Navy-Vale Community League
National Alliance for Quieter Communities
Neighbors Opposed to Irritating Sound Emissions

NUMEROUS INTERESTED INDIVIDUALS

SECTION II: DESCRIPTION AND PURPOSE OF THE FEDERAL ACTIONS

The Federal Government, through the Federal Aviation Administration (FAA) of the Department of Transportation (DOT), has control over and the responsibility for the management, operation, and maintenance of two air carrier airports serving the Washington, D. C., area. These airports, Washington National and Dulles International, comprise the Metropolitan Washington Airports.

In addition to the two major Washington airports, the region is also served by the Baltimore-Washington International Airport (Baltimore-Washington), located in Anne Arundel County, Maryland. While the Federal Government has no managerial control over Baltimore-Washington, actions taken with respect to Washington National and Dulles Airports may have an effect on the utilization of Baltimore-Washington. Analysis has been provided within this report presenting the effects of the policy alternatives on the Baltimore-Washington Airport and its environs.

There are two Federal actions concerning Washington National and Dulles International Airports which are the subject of this Final EIS. These Federal actions include the environmental impacts of the existing or ongoing operation of the two Federal airports and the environmental findings associated with the final policy options under consideration as the Metropolitan Washington Airports Policy. One of these policy options will be selected by the Secretary of Transportation as the Metropolitan Washington Airports Policy to guide the future operation of the two Federal airports.

This Final EIS provides in a single document, environmental assessments that: (1) satisfy the requirements of a 1976 Court Order by the U.S. District Court for the Eastern District of Virginia for an environmental impact statement on the ongoing operation of the subject airports, and (2) present the environmental findings associated with the policy alternatives under consideration. A policy will be developed from within the range of these alternatives to guide the future operation of the airports. Relevant impacts are evaluated for each airport in terms of existing conditions and future policy conditions.

Since the two Federal actions can be evaluated together in this manner, the consideration of alternatives to the existing or ongoing operation of the airports is most logically covered by the evaluation of policy alternatives for future operation of those airports.

ONGOING FEDERAL ACTION

The first action to be described is the FAA's existing operation of Washington National and Dulles International Airports. The existing operation of each airport is presented below in terms of existing facilities, operational characteristics and policy.

WASHINGTON NATIONAL AIRPORT

Washington National Airport (National) occupies approximately 860 acres on the Virginia shore of the Potomac River, 4.5 miles from downtown Washington, D. C. (see Exhibit II-1). It is bordered on the west by Arlington County, Virginia and lies north of the City of Alexandria, Virginia (see Exhibit II-2).

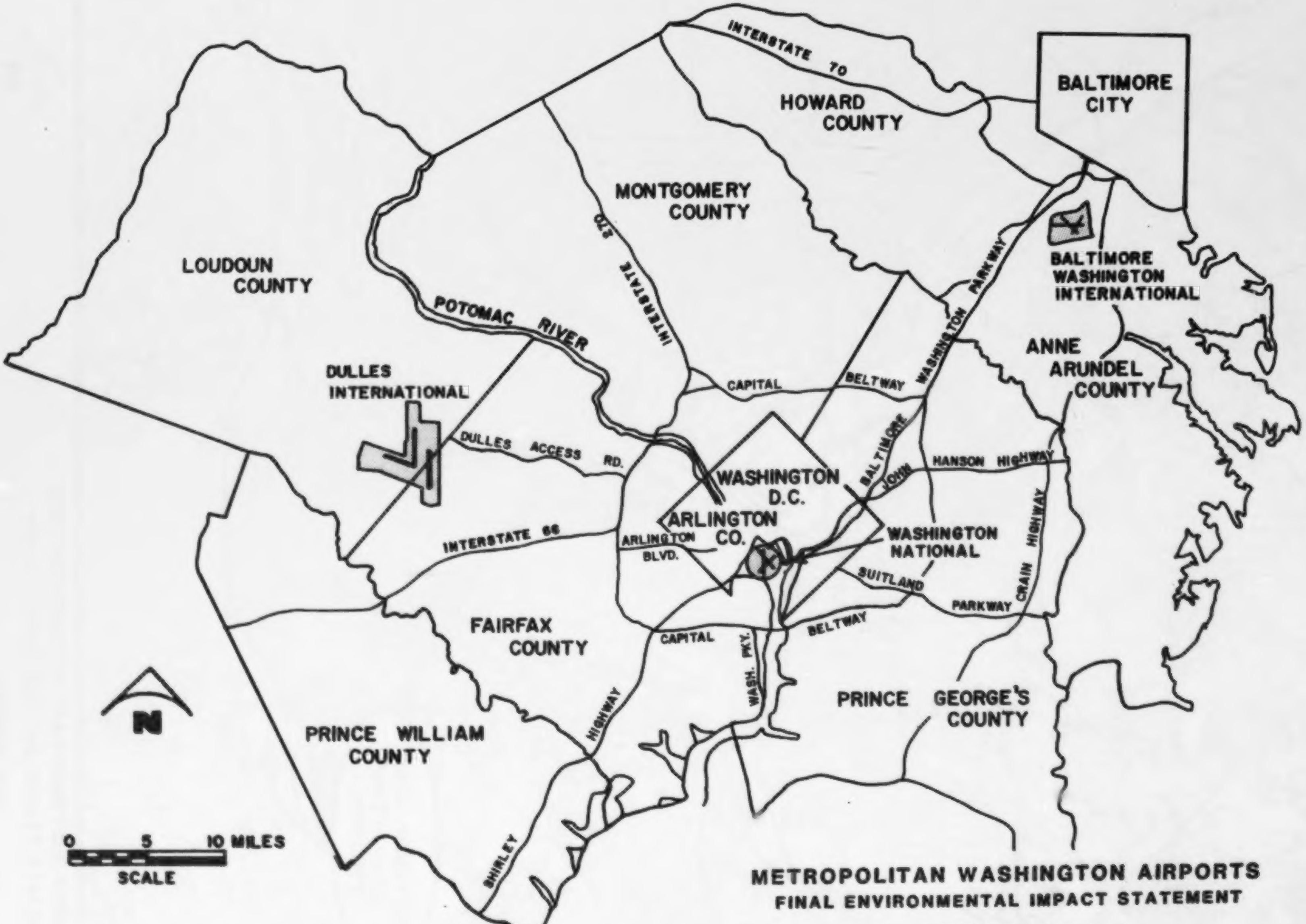
Existing facilities at National Airport are depicted on Exhibit II-3. The main runway lies in a north-south orientation and is 6,870 feet in length. To the west of the principal runway system is the main terminal building which was built in the early 1940s. The north terminal building was added in 1958. Although some significant modernization has been accomplished recently by several air carriers, the aesthetic appearance and internal circulation systems need to be improved. Present terminal facilities at National can, comfortably handle about 3,500 passengers per hour. Many more can and do occasionally pass through the airport, but only with a noticeable increase in congestion and delay.

A general aviation and commuter terminal is located further to the north on the site. Hangars to the north and south are utilized for general aviation, storage, maintenance and repair, by commuter and air carrier airlines, as freight facilities, and as FAA and airline offices.

Major access to the airport is by the George Washington Memorial Parkway and U.S. Route 1. These roads are also major commuting routes and are operating at or near capacity during peak hours. The Washington Metro fixed rail transit service has been extended to the airport.

National Airport is currently the most utilized Metropolitan Washington Airport. Over 15 million air passengers used National during Calendar Year 1979. As a result of the recent slow down in the economic growth in the U.S., the rate of growth in passengers at National has decreased. It is anticipated that 1980 passengers will be approximately the same as those in 1979. Table II-1 depicts utilization of the three air carrier airports in the Washington-Baltimore region for the fiscal year ending in September 1979.

In recognition of its facility limitations and of the noise-sensitive nature of the surrounding area, certain operating limitations are in use at National. Most of these have been in effect since the late 1960s. The first was the imposition of an airspace-oriented capacity limitation. National is operated under the FAA's High Density Rule which, in general, limits the scheduling of air carrier activity at National to no more than 40 flights per hour (exclusive of extra sections), commuters to eight scheduled operations per hour and provides a mechanism to limit general aviation activity to 12 operations per hour during instrument flight rule (IFR) conditions.

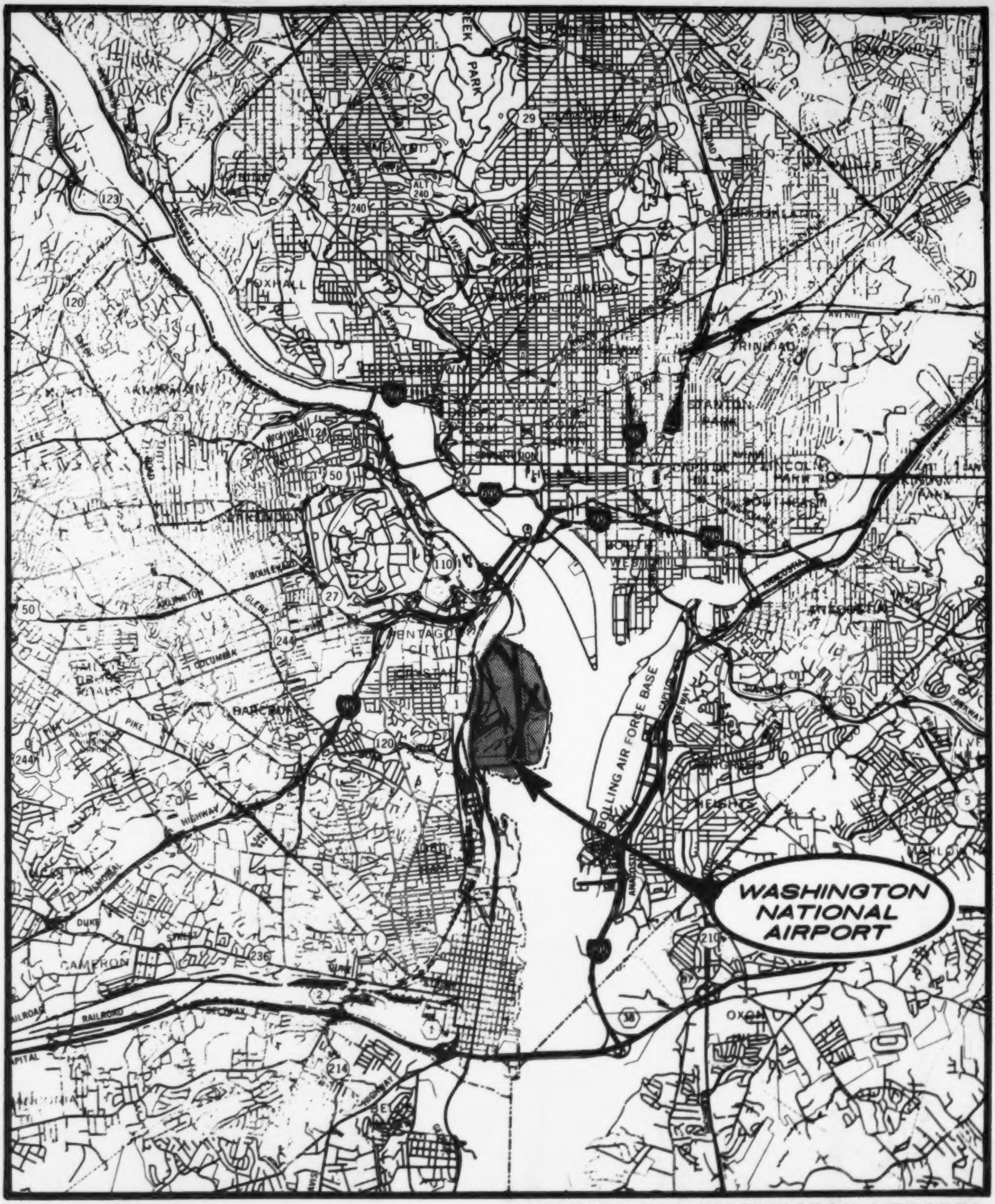


INTERSTATE 70
BALTIMORE CITY
HOWARD COUNTY
MONTGOMERY COUNTY
INTERSTATE 270
LOUDOUN COUNTY
POTOMAC RIVER
BALTIMORE WASHINGTON INTERNATIONAL
PARKWAY
WASHINGTON
ANNE ARUNDEL COUNTY
DULLES INTERNATIONAL
CAPITAL
BELTWAY
BALTIMORE
DULLES ACCESS RD.
JOHN HANSON HIGHWAY
WASHINGTON D.C.
ARLINGTON CO.
INTERSTATE 66
ARLINGTON BLVD.
WASHINGTON NATIONAL
SUITLAND
PARKWAY
CRAIN HIGHWAY
FAIRFAX COUNTY
CAPITAL
BELTWAY
WASH. PKY.
HIGHWAY
PRINCE GEORGE'S COUNTY
N
PRINCE WILLIAM COUNTY
0
5
10 MILES
SCALE
SHIRLEY

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

LOCATION MAP

EXHIBIT II-1


WASHINGTON NATIONAL AIRPORT
BOLLING AIR FORCE BASE
FOXHALL
STANTON PARK
TRINIDAD
PENTAGON CITY
CRYSTAL CITY
CAMERON
ARLINGTON
COLUMBIA
HIGHWAY
DUKE
RAILROAD
BOULEVARD
GLEBE
PIKE
PARK
29
123
120
240
ALT 240
50
124
110
27
244
1
7
236
2
214
210
5
95
295
695
395

N

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METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

VICINITY MAP
NATIONAL AIRPORT

EXHIBIT II-2

TABLE II-1

WASHINGTON-BALTIMORE REGION
TOTAL PASSENGERS AND AIRCRAFT OPERATIONS FOR CALENDAR YEAR ENDING DECEMBER 31,1979

	Total Annual Air Passengers[a]	Percent (air passenger) of Regional Total[a]	Total Annual Aircraft Operations	
Washington National Airport	15,134,107	67.4%	Air Carrier	207,112
			Commuter	48,594
			Gen. Aviation	96,802
			Military	396
			Total	352,904
Dulles International Airport	3,462,850	15.4%	Air Carrier	53,181
			Commuter	9,210
			Gen. Aviation	101,175
			Military	9,402
			Total	172,974
Baltimore-Washington International Airport	3,864,443	17.2%	Air Carrier	76,075
			Commuter	40,734
			Gen. Aviation	99,875
			Military	3,543
			Total	220,227
TOTAL REGION	22,461,300	100%	Total Operations	746,105

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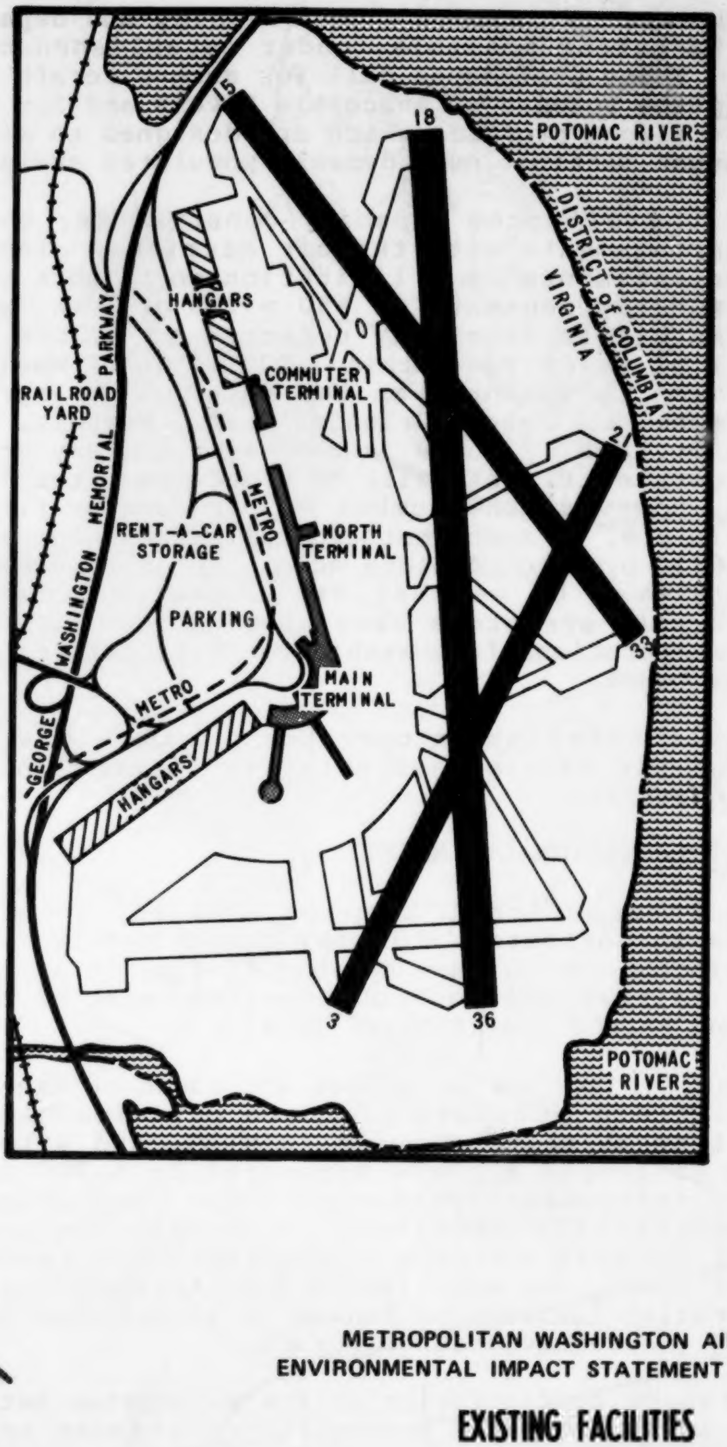
[a] Does not include military passengers.

SOURCE: Metropolitan Washington Airports records.


15
18
POTOMAC RIVER
DISTRICT of COLUMBIA
VIRGINIA
HANGARS
COMMUTER TERMINAL
RAILROAD YARD
GEORGE WASHINGTON MEMORIAL PARKWAY
METRO
RENT-A-CAR STORAGE
NORTH TERMINAL
PARKING
MAIN TERMINAL
METRO
HANGARS
21
33
3
36
POTOMAC RIVER
N
0' 675' 1350'

METROPOLITAN WASHINGTON AIRPORTS
ENVIRONMENTAL IMPACT STATEMENT SUPPLEMENT

EXISTING FACILITIES
NATIONAL AIRPORT

EXHIBIT II-3

In addition, jet aircraft approaching and departing National do so, to the extent possible, under established noise abatement procedures. These procedures call for such aircraft to follow corridors along the Potomac or Anacostia Rivers and for departing aircraft to use flight profiles which are designed to minimize the use of higher thrust settings near densely populated areas.

Beyond the airspace capacity constraints, the airport has voluntary arrangements with the air carriers. Included in these voluntary arrangements is a limitation on flights to and from the airport to nonstop segments of 650 miles or less, with the exception of seven cities (commonly referred to as the "grandfather" cities), all of which lie within 1,000 miles of Washington and had nonstop service to National on the date of the agreement. These are Miami, West Palm Beach, Orlando, Tampa, Memphis, St. Louis, and Minneapolis/St. Paul. There is another voluntary arrangement that no jet air carrier flights will be scheduled after 10 p.m. and before 7 a.m. However, the number of air carrier flights scheduled exactly at 10 p.m. is such that typically these operations take until about 10:30 p.m. to complete and later on some nights when aircraft are delayed by weather or mechanical reasons. General aviation aircraft operators have also joined the effort to abate noise in the operations from Washington National, especially during the nighttime hours.

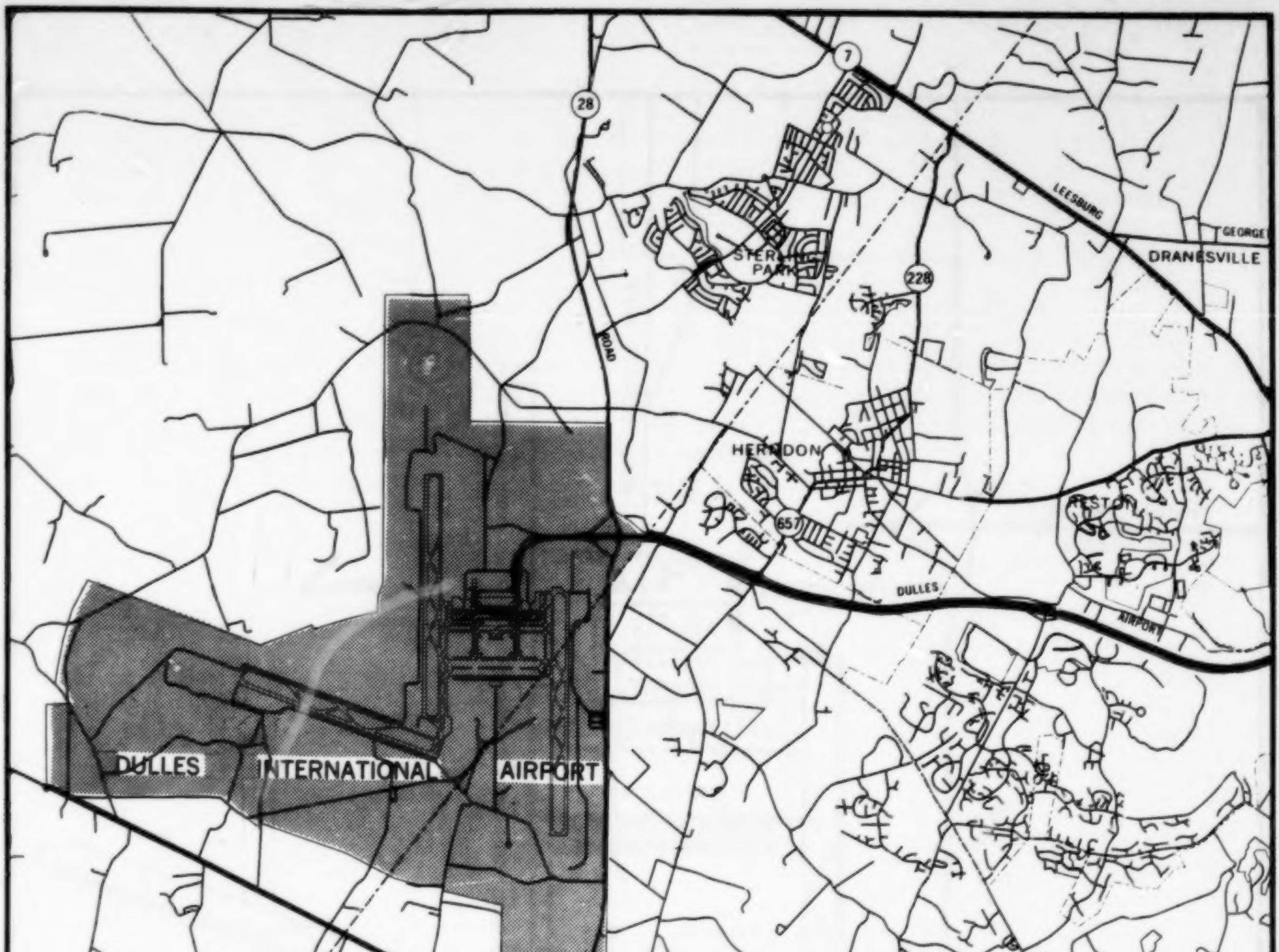
A final constraint on operations at National includes the limitation of air carrier jet activity to two- and three-engine narrow body aircraft.

DULLES INTERNATIONAL AIRPORT

Dulles International Airport (Dulles) encompasses almost 10,000 acres in northern Virginia, approximately 26 miles west of central Washington, D. C. (see Exhibit II-1). It is located on the boundary of Fairfax and Loudoun Counties, west of the communities of Herndon and Reston (see Exhibit II-4).

Existing facilities at Dulles are shown on Exhibit II-5. The existing airfield consists of three principal active runways. The parallel north-south runways (01R-19L and 01L-19R) are both 11,500 feet in length and are separated by 6,700 feet to permit simultaneous instrument approaches. The longitudinal runway offset was specifically developed to facilitate use of separate landing and takeoff runways. The east-west runway (12-30) is 10,000 feet long. In addition to the three principal runways, adjacent parallel taxiways on Runway 12-30 and 01R-19L are utilized as runways by general aviation aircraft.

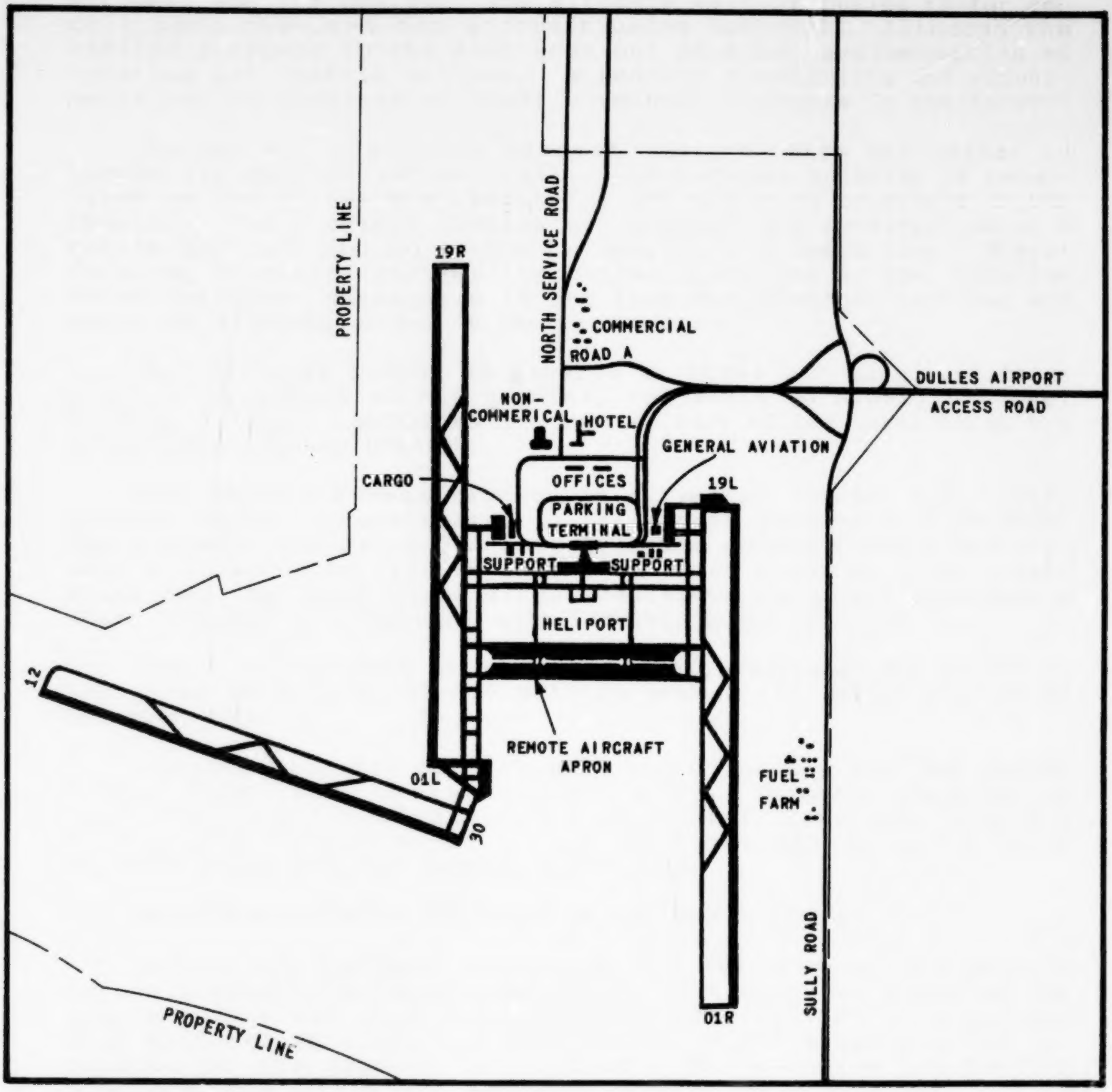
The airspace configuration in the Washington Metropolitan Area to the east of Dulles is a potential constraint to operations at Dulles. Essentially, there is separate airspace designated for


7
28
LEESBURG
GEORGE
DRANESVILLE
STERLING PARK
228
ROAD
HERNDON
657
RESTON
DULLES
AIRPORT
DULLES INTERNATIONAL AIRPORT
LEE
CHANTILLY
JACKSON
MEMORIAL
50
HIGHWAY
SULLY
28
ROAD
HIGHWAY
29 211
LEE
CENTREVILLE
N
0' 4000' 8000'

METROPOLITAN WASHINGTON AIRPORTS
ENVIRONMENTAL IMPACT STATEMENT SUPPLEMENT

VICINITY MAP
DULLES AIRPORT

EXHIBIT II-4


PROPERTY LINE
19R
NORTH SERVICE ROAD
COMMERCIAL
ROAD A
DULLES AIRPORT
ACCESS ROAD
NON-
COMMERICAL
HOTEL
GENERAL AVIATION
CARGO
OFFICES
PARKING
TERMINAL
19L
SUPPORT
SUPPORT
HELIPORT
12
REMOTE AIRCRAFT
APRON
FUEL
FARM
01L
30
SULLY ROAD
01R
PROPERTY LINE
N
0'
1700'
3400'

METROPOLITAN WASHINGTON AIRPORTS
ENVIRONMENTAL IMPACT STATEMENT SUPPLEMENT

EXISTING FACILITIES
DULLES AIRPORT

EXHIBIT II-5

National and for Dulles. The airspace east of Dulles is for the most part reserved for aircraft using National. Although the limited airspace to the east does not prohibit accommodation of existing air traffic volumes, it reduces flexibility and adjustments may be required as traffic volumes increase in the future.

Dulles was the first airport designed from the outset to handle air carrier jet aircraft. The terminal building is recognized as one of the most beautiful and effective terminals in the country. The terminal complex was planned and developed using a remote aircraft parking system for most airline operations. Therefore, an essential part of the Dulles operation is the vehicles which transport passengers to and from the passenger terminal and gates and aircraft parked on the remote apron.

Air cargo at Dulles is handled at three air cargo buildings located northwest of the terminal, adjacent to Runway 01L-19R. General aviation facilities are located east of the terminal at the north end of Runway 01R-19L.

The Dulles access highway is a limited access, four-lane, divided facility constructed to interstate geometric standards. The highway extends to the east from the airport towards Washington, a distance of over 13 miles, at which point it joins Interstate 495 (Beltway) via a directional interchange and continues a short distance to a terminus with Virginia Route 123.

Since its opening in November, 1962, passenger use of Dulles has grown to a level of 3.5 million annual air passengers as of December 1979.

Airside capacity of Dulles is approximately 100 Instrument Flight Rule (IFR) operations per hour. Terminal capacity of approximately 1,800 passengers per hour is sometimes exceeded during peak hours, however, the terminal is currently being expanded along with the baggage claim area.

DIFFERENTIATION OF THE ROLES OF THE TWO AIRPORTS

Dulles was designed to provide all levels of airline service to the Metropolitan Washington area. National has served as the area's medium and short-haul airport. In 1966, nonstop flights from National were limited to a radius of 650 miles with the exclusion of the grandfather cities. These cities had nonstop service on the date of the agreement to limit such activity.

PURPOSE OF THE FEDERAL ACTIONS

The Washington-Baltimore region is served by three air carrier airports, two of which--National and Dulles--are operated by the Federal Government. The two Federal airports have been operating without a formalized, comprehensive policy defining their respective roles and guiding their day-to-day operations. Rather, for the past decade, they have been operated under an informal plan which, in essence, continues their historic roles as modified in 1966 and described above.

Significant technical, regulatory, and social changes have occurred in the interim which call for a reconsideration of this nonformalized "policy." These changes include, among other things: (a) increasing community concern over the environmental impact emanating from flight operations in the local area, especially National; (b) recent indications that use of the new generation of narrow and wide-body-aircraft--A300s, B-767s, B-757s, DC-10s, and L-1011s--at National might be desirable as a means of reducing noise around the airport; and (c) anticipated increases in air travel demand to and from the Washington area which will require expansion and/or more efficient utilization of existing regional airport capacity.

In addition, while Dulles and Baltimore-Washington are relatively free of significant operational problems, National is not. These problems include:

* Roadway and terminal congestion and substantial environmental impacts, especially the impacts of aircraft noise;

* The overburdened and outdated landside facilities at National; and

* Operating limitations currently in effect which: (a) constrain access by commuter carriers including carriers seeking to replace short-haul services given up by the air carriers, (b) preclude equitable market competition among communities desiring service access into National, and (c) preclude use of the newer generation of aircraft.

The problems at National, coupled with the significant technical, regulatory, and social changes that have occurred over the past decade, suggest the need for a policy which will guide the two Federal airports in serving the air transportation needs of the Nation's Capital. It is clear that operating, planning, and investment decisions at the two Federal airports cannot logically be made without an underlying policy which sets forth the manner in which each of the two facilities is to contribute to meeting the region's overall aviation needs. Once a policy is adopted, physical redevelopment of National could then proceed in accordance with the airport's role as defined by the policy, while timely additions would be added at Dulles to fulfill its defined role.

POLICY OBJECTIVES

The Department of Transportation's review and consideration of possible changes to or refinements in its management and operation of the two FAA-operated Washington area airports have been undertaken with the following objectives in mind:

1. To rationalize the role and use of the two airports from an overall transportation viewpoint;
2. To achieve full utilization of existing and planned capacity at the airports;
3. To eliminate unnecessary constraints on the use of equipment at the airports;
4. To ensure that the growth, uses, and roles of the airports are as compatible as possible with the changing demands and expectations of the community, especially with respect to environmental quality; and
5. To permit planning for and implementation of improvements at National Airport, but only those improvements that are consistent with its role.

PUBLIC AND AGENCY INVOLVEMENT

The Federal Aviation Administration released a proposed policy and Draft Environmental Impact Statement for Metropolitan Washington Airports in March of 1978. A wide range of policy options defining various roles for the Metropolitan Washington Airports were tested and evaluated in an FAA policy analysis. A total of 32 policy alternatives were analyzed. These included the existing 1976 base case; a no policy change case for 1990; a proposed policy case; and various combinations of three basic scenarios: (1) growth restrictions at National; (2) wide body aircraft at National; and (3) wide body aircraft and growth restrictions at National.

The FAA conducted four public hearings in May of 1978 in order to receive public testimony concerning its policy proposal and 32 alternatives. Copies of the draft environmental impact statement were placed in all branch and main libraries in the Washington-Baltimore region to afford the public an opportunity to review the policy proposal and environmental document prior to the hearings. In addition, copies of the environmental statement were sent to all cities with one-stop and nonstop service into National; Federal, State, and local agencies; local municipal and county governments; interested public and private organizations; and interested citizens. The public hearings were held at the following locations:

May 23, 1978

Marriott Hotel Dulles International Airport Loudoun, Virginia	5 speakers - 48 pages of testimony

Marriott Twin Bridges Arlington, Virginia	25 speakers - 101 pages of testimony

May 24, 1978

FAA Headquarters 800 Independence Avenue, S.W. Washington, D. C.	20 speakers - 135 pages of testimony
Albert Einstein High School 11135 Newport Mills Road Kensington, Maryland	21 speakers 84 pages of testimony

The comment period to receive written comments was extended to August of 1978. Almost 1,000 written comments were received.

The Department of Transportation and the Federal Aviation Administration decided to modify the 1978 policy proposal and issue a supplement to the draft environmental impact statement to gain further public input prior to making a final policy decision for the following reasons:

- * The key issues identified in the written comments and oral testimony at the public hearings necessitated a modification to the policy proposal;
- * Some problem areas were identified within the 1978 policy proposal and DEIS; and
- * The unforeseen impacts on the aviation industry brought on by the Airline Deregulation Act of 1978 were not considered in the 1978 policy effort.

The comments received on the 1978 policy proposal and Draft Environmental Impact Statement revealed sharp differences of opinion on the role Washington National should play in the aviation system of the Washington region. For the most part, the interested parties approached the policy proposal from either of two valid perspectives--one national and the other local. Local interests expressed the strong view that, with two other air carrier airports available in the region, the concentration of air carrier activity at National is an unwarranted and unnecessary burden on the airport neighbors who are subject to high levels of aircraft noise. Other interests, many of which are outside the Washington area, expressed an equally strong national view and believe National's uniquely convenient location should be made available to air travelers who want direct access to downtown Washington. Those supporting this national interest argue that Washington National, as a Federally owned and operated airport serving the Nation's Capital, necessarily performs more of a national role than a local one.

The Supplement to the Draft Environmental Impact Statement presented these two positions as a Restricted Growth at National alternative that reflected the local perspective and as an Expanded Growth at National alternative that reflected the national perspective. The Restricted Growth at National alternative was developed from the comments of the Metropolitan Washington Council of Governments while the Expanded Growth at National alternative was developed from the comments of the airline industry. The FAA proposed a policy for consideration in the supplement which attempted to balance these two positions by permitting growth under controlled conditions and set a limit on the absolute level of passengers permitted at National to 18 million total annual passengers.

The supplement contained consideration of the following alternatives:

* Proposed Policy

* No Policy Change alternative

* Expanded Growth at National alternative

* Restricted Growth at National alternative

The Supplement to the Draft EIS was issued in January 1980. Three public hearings were conducted in MArch 1980. Copies of the Supplement were placed in all branch and main libraries in the Washington-Baltimore region to afford the public an opportunity to review the environmental document prior to the hearings. In addition, copies of the Supplement were sent to all parties who submitted oral testimony or written comments on the March 1978 Draft EIS; Federal, State and local agencies; local, municipal, and county governments; interested public and private organizations; and interested citizens. The public hearings were held at the following locations.

March 20, 1980	
Key Bridge, Marriott	32 speakers
Rosslyn, Virginia	132 pages of testimony
March 25, 1980	
Dulles International Airport	14 speakers
Marriott Hotel	59 pages of testimony
Loudoun, Virginia	
March 27, 1980	
Key Bridge Marriott	41 speakers
Rosslyn, Virginia	164 pages of testimony

The comment period to receive written comments was extended to April 15, 1980. Almost 500 written comments were received.

The testimony received at these hearings, together with comments received at the local, State, and national level, continued to focus on the polar positions expressed by local and national interests. In response to the comments received on the Supplement to the Draft EIS, further fine tuning of alternatives was conducted. This Final EIS contains five policy alternatives.

ALTERNATIVE FEDERAL ACTION POLICIES

BACKGROUND

Within this report, five alternative policies for the operation of the Metropolitan Washington Airports have been analyzed. These five alternatives cover the range of options available from a significant reduction in activity at National to an expanded role for the airport. Included in the alternatives is consideration of the consequence of making no change in the current operating practice at National.

Although the Federal Aviation Administration (FAA) does not establish operational policies at Baltimore-Washington, the policy decisions at Dulles and National will indirectly affect air traffic activity at Baltimore-Washington and, therefore, impacts associated with each alternative have also been analyzed for Baltimore-Washington.

The five alternatives under consideration have been developed as a result of the FAA's study into options available at each of the airports and also as a direct result of input provided throughout the environmental review process. Initially, 32 preliminary alternatives or cases were studied by the FAA in a report entitled Metropolitan Washington Airport Policy Analysis. Based on this work, a wide range of policy options defining various roles for the airport were tested and evaluated in the Draft Environmental Impact Statement (DEIS) for the Metropolitan Washington Airport Policy published in March 1978. Quotas, curfews and possible wide-body aircraft service at National were examined for potential policy impacts on regional air travelers, community residents, and airport investment requirements. Subsequent to this study, a Supplement to the DEIS was published in January of 1980. This Supplement considered three basic alternatives plus a proposed policy for the operation of the airport.

The Final EIS has refined these alternatives and expanded the alternatives under consideration as a result of continued FAA study and input received from various Federal, State, and local agencies, community groups, the aviation industry and the general public. The alternatives considered in this Final EIS are:

* No Policy Change (Base Case)

* Expanded Growth Policy at National

* Controlled Growth Policy to 16 Million Passengers at National

* Controlled Growth Policy to 18 Million Passengers at National

* Reduced Activity Policy At National

Each alternative is defined in Table II-2 on the basis of passenger limits, operating and scheduling hours, the allocating of slots among the classes of aircraft activity, the type of aircraft permitted to use the airport, and a perimeter limit. Each of the five alternatives is briefly described below.

NO POLICY CHANGE

This alternative represents the base case against which each of the alternatives can be compared and reflects continued growth at the airport. Aircraft operations would be limited to sixty per hour and aircraft larger than B727-200 would not be allowed. Air carrier slots would be limited to forty per hour between 7:00 a.m. and 10:00 p.m.; commuters would continue to receive 8 slots per hour; and general aviation would receive 12 slots per hour. The perimeter would remain at 650 miles with the seven "grandfather" cities.

Within this alternative, increases in passengers using National would not be controlled or limited except through the limits of available slots. The role of Dulles would also not be altered under this policy.

EXPANDED GROWTH POLICY AT NATIONAL

This alternative embodies many of the policy provisions recommended by the airline industry for operation at National. As with the No Policy Change, there would be no formal limit on passenger growth at National nor would the operating hours be changed. This policy, however, would permit the use of widebody aircraft at the airport and would establish a 1,000 mile nonstop perimeter. Scheduling hours would be slightly reduced to limit night flights (the 10 p.m. scheduling minute would be eliminated). Slots would be allocated during scheduling hours on a variable level from 34 to 44 per hour plus extra sections on weekdays with a lower level on weekends. Commuters and general aviation would share the remainder of the 60 slots per hour. Table II-3 shows the slot distribution proposal under this alternative.

CONTROLLED GROWTH POLICY TO 18 MILLION PASSENGERS AT NATIONAL

Unlike the existing policy, this alternative would establish a formal fixed limit on the number of passengers permitted to use National and was previously identified in the Supplement to the Draft EIS for the Washington Metroplitan Airports Policy as the "proposed policy." Growth in a controlled manner from its present level of slightly over 15 million to 18 million total annual passengers would be allowed. Scheduling hours would be reduced

TABLE II-2

ALTERNATIVE POLICIES FOR NATIONAL AIRPORT

OPTIONS	NO POLICY CHANGE (BASE CASE)	EXPANDED GROWTH POLICY	CONTROLLED GROWTH POLICY TO 18 MILLION PASSENGERS	CONTROLLED GROWTH POLICY TO 16 MILLION PASSENGERS	REDUCED ACTIVITY POLICY TO 14 MILLION PASSENGERS
PASSENGER LIMIT	No limit on total annual passengers at National.	No limit on total annual passengers at National.	Annual total passenger limit of 18 million at National.	Annual total passenger limit of 16 million at National.	Annual total passenger limit of 14 million at National
SCHEDULING HOURS	Scheduling hours for air carrier jets: 7:00 a.m. until 10:00 p.m. Air carrier and commuter props may be scheduled at any time within slot limits.	Air carrier scheduling hours: 7:00 a.m. until 9:59 p.m. Commuter props any time within slot limits.	Scheduling hours for air carrier and commuters 7:00 a.m. until 9:30 p.m.	Scheduling hours for air carrier and commuters 7:00 a.m. until 9:30 p.m.	Scheduling hours for air carrier and commuters: 7:00 a.m. until 9:30 p.m.
OPERATING HOURS	Operating hours - 24 hours (informal agreement, no general aviation jets after 11:00 p.m. and before 7:00 a.m.	National open 24 hours except: no general aviation jets after 11:00 p.m. and before 7:00 a.m.	Operating hours for National 7:00 a.m. until 10:30 p.m. with arrivals permitted until 11:00 p.m.; closed to all traffic except for emergencies 11:01 p.m. until 6:59 a.m.	Operating hours for National 7:00 a.m. until 10:30 p.m. with arrivals permitted until 11:00 p.m.; closed to all traffic except for emergencies 11:01 p.m. until 6:59 a.m.	Operating hours for National 7:00 a.m. until 10:30 p.m.; closed to all traffic except emergencies 10:31 p.m. until 6:59 a.m.
ALLOCATION OF SLOTS	Allocation of scheduled slots (high density rule): Air Carrier 40/hr (+ extra sections); Commuters - 8/hr; Gen. Aviation - 12/hr.	Air carrier hourly schedule variable from 34 to 44 (+ extra sections) on weekdays with lower levels on weekends, commuter and general aviation fill remainder of slots up to total 60/hr.	Allocation of scheduled slots (initial):* Air Carrier - 36/hr. (+ extra sections); Commuters - 12/hr.; Gen. Aviation - 12/hr.	Allocation of scheduled slots (initial):* Air Carrier - 36/hr. (+ extra sections); Commuters - 12/hr.; Gen. Aviation - 12/hr.	Allocation of scheduled slots: Air Carrier - 20/hr. by 1985, total of general aviation and commuter - 40/hr.
AIRCRAFT LIMITATIONS	Maximum size aircraft permitted 727-200 (no 4 engine jets, 2 or 3 engine wide-bodies.	2 and 3 engine wide-bodies permitted in addition to those currently allowed.	2 and 3 engine wide-bodies permitted, in addition to those currently allowed.	2 and 3 engine wide-bodies permitted, in addition to those currently allowed.	2 and 3 engine wide-bodies permitted, in addition to those currently allowed.
PERIMETER	650 statute mile nonstop perimeter at National plus 7 "grandfather cities" (CAB agreement with airlines).	1000 statute mile nonstop perimeter.	1000 statute mile nonstop perimeter.	1000 statute mile nonstop perimeter.	650 statute mile nonstop perimeter at National (no grandfather cities, i.e., existing 7 grandfather cities to lose service).

*Additional air carrier slot reductions would be used to maintain total passenger limit.

NOTE: Dulles International Airport will continue to serve all levels of airline service to and from Washington area.

TABLE II-3

SLOT ALLOCATION
EXPANDED GROWTH POLICY AT NATIONAL

	HOUR OF THE DAY															
Mon.-Fri.	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	Total
Air Carrier	34	44	44	44	36	36	44	44	44	44	44	44	44	44	36[a]	626
Commuter	14	12	12	12	12	12	12	12	12	12	12	12	12	12	12	182
Gen. Aviation	12	4	4	4	12	12	4	4	4	4	4	4	4	4	12	92
Total	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	900
Saturday																
Air Carrier	32	40	40	40	36	36	36	40	40	40	32	32	30	30	30[b]	534
Commuter	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	120
Gen. Aviation	10	4	4	4	8	8	8	4	4	4	4	4	4	4	4	78
Total	50	52	52	52	52	52	52	52	52	52	44	44	44	44	44	732
Sunday																
Air Carrier	28	34	34	36	36	36	36	44	44	44	44	44	44	44	36[a]	584
Commuter	8	8	8	8	12	12	12	12	12	12	12	12	12	12	12	164
Gen. Aviation	10	4	4	4	12	12	12	4	4	4	4	4	4	4	12	98
Total	46	46	46	48	60	60	60	60	60	60	60	60	60	60	60	846

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[a] 18 operations 9:00 p.m. to 9:29 p.m. 18 operations 9:30 p.m. to 9:59 p.m.

[b] 15 operations 9:00 p.m. to 9:29 p.m. 15 operations 9:30 p.m. to 9:59 p.m.

SOURCE: Air Transport Association.

to 7:00 a.m. to 9:30 p.m. in order to reduce the amount of night flying. To further this aim, the airport would be closed from 11:01 p.m. until 6:59 a.m. No departures would be permitted after 10:30 p.m. and arrivals would continue until 11:00 p.m., except for emergencies.

Air carrier slots would initially be reduced to 36 per hour plus extra sections; additional reduction in slots would be introduced to maintain the 18 million passenger limit. Initially, commuters would be assigned 12 slots per hour and general aviation 12 slots per hour. As air carrier slots were reduced to maintain the 18 million passenger limit, the slots would be shifted to commuters to maintain a total of 60 slots per hour. Only half the hourly slots would be permitted to be used during the 9:00 p.m. to 9:30 p.m. timeframe.

Widebody aircraft would be permitted to use the airport and a nonstop perimeter would be established to include all cities within 1,000 miles. Dulles would be maintained as the long-haul and international airport, with an increasing role in the short- and medium-haul market as the regional growth in aviation continued and passengers were shifted to Dulles and Baltimore-Washington in recognition of the 18 million passenger limit at National.

CONTROLLED GROWTH POLICY TO 16 MILLION PASSENGERS AT NATIONAL

This alternative is identical in all aspects to the preceding one, except that a limit of 16 million total annual passengers, about a 5 percent increase over current levels of passenger activity, would be established for National.

REDUCED ACTIVITY POLICY AT NATIONAL

Unlike the previous alternatives, this policy would set as a goal a passenger limit below the level of current activity. A 14 million total annual passenger limit would be set for National; additional growth would occur at Dulles or Baltimore-Washington.

This alternative represents the basic concept suggested by local governments through the Metropolitan Washington Council of Governments to reduce activity levels at National. In order to accomplish this end, air carrier slots would be reduced more than 50% to 20 per hour by 1985, extra sections would be eliminated, scheduling hours would be reduced to 7:00 a.m. until 9:30 p.m. and the airport would be closed except for emergencies between 10:31 p.m., and 6:59 a.m. Commuters and general aviation would equally share the remaining 40 slots.

Aircraft limitations would be relaxed to permit the use of 2 and 3 engine wide body aircraft, while the perimeter would be set at 650 miles with no exceptions for the so-called "grandfather" cities.

At Dulles and, to a lesser degree, at Baltimore-Washington, this alternative would cause a significant increase in activity due to the reduction in passengers below current levels, the need to accommodate all future growth in the region and the reduction in the perimeter at National.

There is an important distinction between the Reduced Activity alternative and the Controlled Growth to 18 million and 16 million alternatives. The Reduced Activity alternative would have a schedule to reduce air carrier operations at National by more than 50% within four years (1985). The Controlled Growth alternatives would establish a passenger ceiling for National and would reduce air carrier operations to maintain that ceiling. There are significant differences in air service impacts between the Controlled Growth and Reduced Activity alternatives. These differences are detailed in the Airline Services sections of this FEIS.

FORECAST SUMMARY BY ALTERNATIVE

In order to evaluate the range of environmental and economic impacts associated with each policy alternative, forecasts of passengers and aircraft operations were prepared. Forecasts have been prepared for each airport under each of the five policy alternatives up to 1995. This time-span covers the period over which each of the policy alternatives would likely have its greatest impact.

As part of the forecasting process, some basic assumptions were made about the future capability of the Washington-Baltimore regional aviation system, as follows:

* Airspace - In the range of operation forecasts considered, there will be sufficient airspace in the region available although its management will become more complex.

* New Airports - During the forecast period (1980-1995), no new major air carrier airports will be built in the area.

* Given the anticipated level of activity, general aviation will continue to be served at the three air carrier airports and also at existing or expanded general aviation airports in the region.

* National Airport - The airfield runways will not be extended although some potential exists to improve apron areas and taxiways (to permit limited numbers of wide bodies) and a runway overrun area may be added in the future. Although it will be difficult, the terminal building, parking areas, and local access road can be improved.

* Dulles International Airport - No new major airfield improvements are forecasted by 1995, however, there is expan-

sion capability, if required. Ongoing terminal expansion will improve capacity to handle potential passenger increases. Dulles will continue to be the principal international airport in the area with a significant amount of long-haul domestic capability.

- Baltimore-Washington International - Recent terminal improvements allow for 11 million total annual passengers. Limited airside improvements will likely be required in the long term for air cargo and general aviation operations.

Certain basic assumptions were also made concerning the future demand for aviation services in the Washington-Baltimore region.

- Economic indicators will be met for the national economy used in the current FAA Terminal Area Forecasts, Fiscal Years 1980-1991, November 1979, by the year 1990, although short-term (1980-1985) growth may not be reached.

- The economy and population of the Washington-Baltimore area will continue to expand as predicted by the Metropolitan Washington Council of Governments and Maryland Department of State Planning.

- Total aviation demand in the region was allocated to each airport in the region under different policy alternatives without affecting the total regional demand. That is, even though the percentage share at any one airport will vary under the different policy alternatives, for any given year, the regional total did not vary as a result of the policy alternatives. For certain close-in aviation markets (100 miles from Washington, D.C.), a shifting of activity from National to another airport may result in an actual loss in the regional total. At these markets, a shift may cause potential aviation passengers to use alternative modes (drive) or not to make the trip at all for those passengers who were bound for Washington, D.C. or the close-in suburbs. However, it is estimated that this portion of the market (within 1000 miles of Washington) constitutes only about 5 percent of the regional total demand and, therefore, the basic assumption remains valid. Essentially, none of the impacts would measurably change if a share of this 5 percent of the regional market did not travel by air especially when this share is divided among 3 airports.

- Once total passengers have been forecasted, operations were calculated based on a forecasted fleet mix and load factors at each airport.

- Load factors and average seating capacity will continue to increase due to increased cost of operations (particularly fuel prices), competition, new aircraft and opportunities offered the airlines due to deregulation.

Once the basic regional aviation system and forecast assumption had been established, passenger forecast assignments for each airport were made. In the strictest sense, aviation passengers were not independently forecast - previous forecasts, and the current FAA Terminal Area Forecasts (TAF) were examined for reasonableness and accepted directly or modified to fit the policy alternative under consideration.

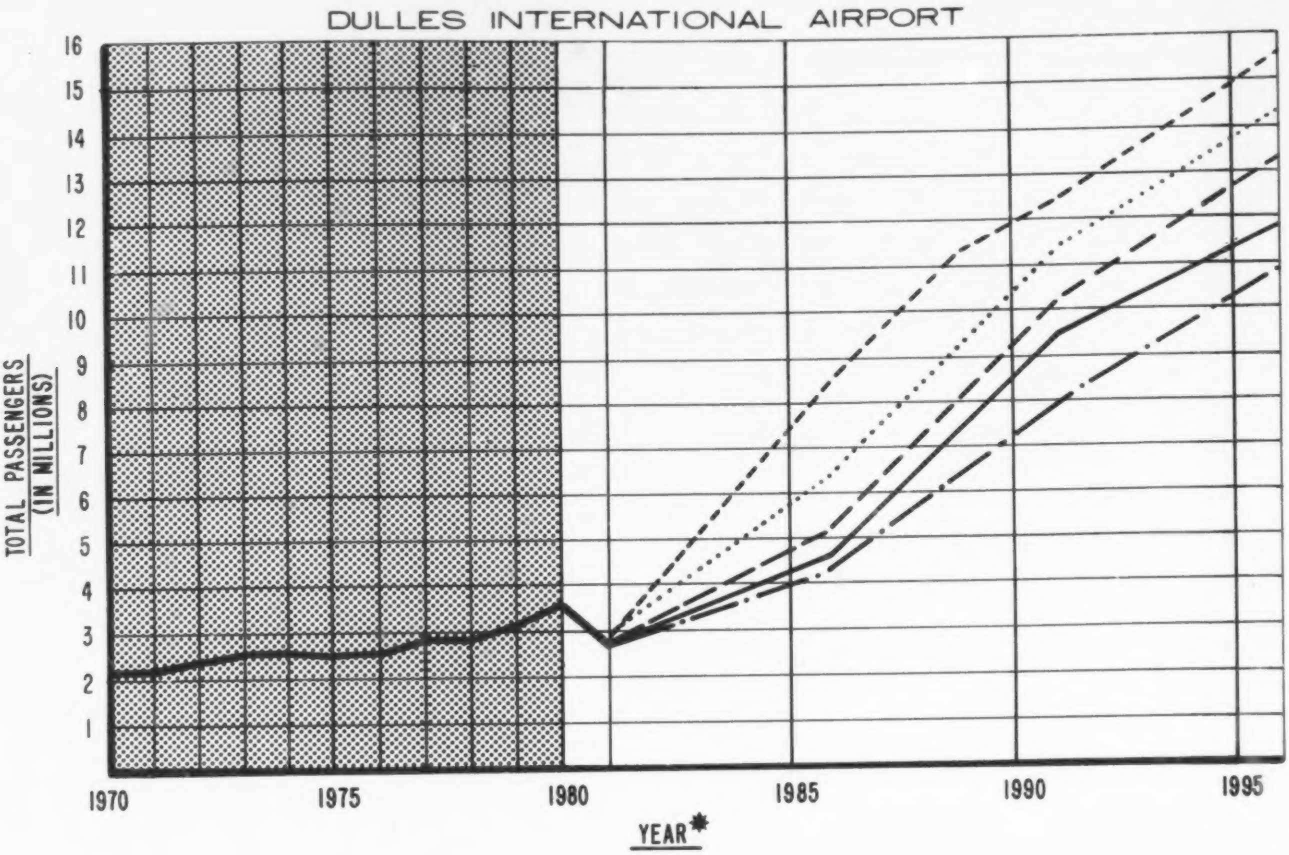
The check for reasonableness began by first assembling airport activity records for National, Dulles, and Baltimore-Washington to form an aggregated historical total for the region. Past forecasts made over the last 5 years were reviewed to determine their success in predicting over the short-term the growth in aviation. Without exception, they all tended to predict on the high side when compared to actual growth. It was therefore concluded that the 1979 TAF presented the most reasonable forecasts of regional total aviation activity, given the economic and aviation system assumptions stated above.

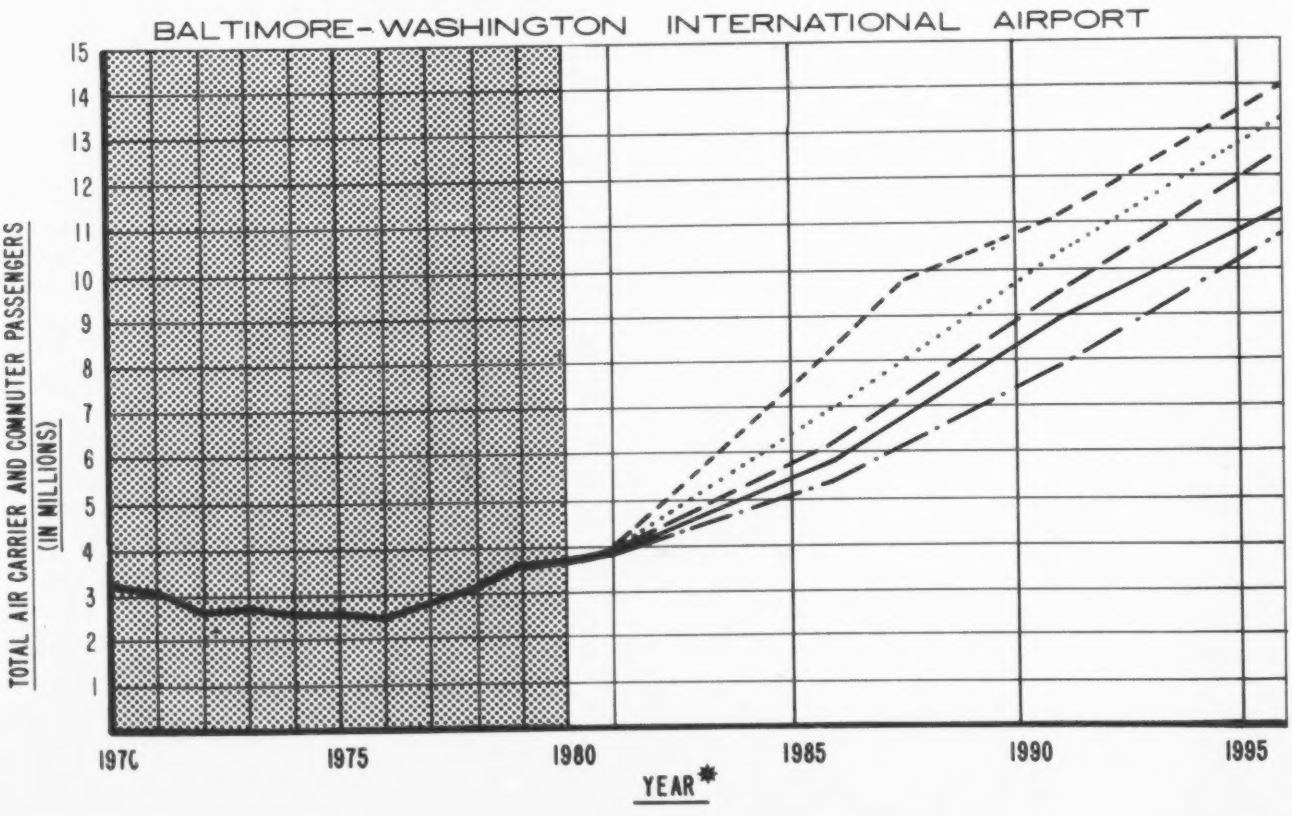
A total regional demand of 37 million passengers in 1990 and 43 million passengers in 1995 was set as the level of passenger activity to be allocated to the three air carrier airports in the region. It is recognized that a short-term reduction in the rate of aviation growth has occurred during 1980 due to the economic slow down in the U.S. economy. It is anticipated that this slump will be temporary and that the above projections in passengers will occur by 1990. These forecasts, illustrated on Exhibit II-6 and Tables II-4 to II-8, list the passenger forecasts for each alternative.

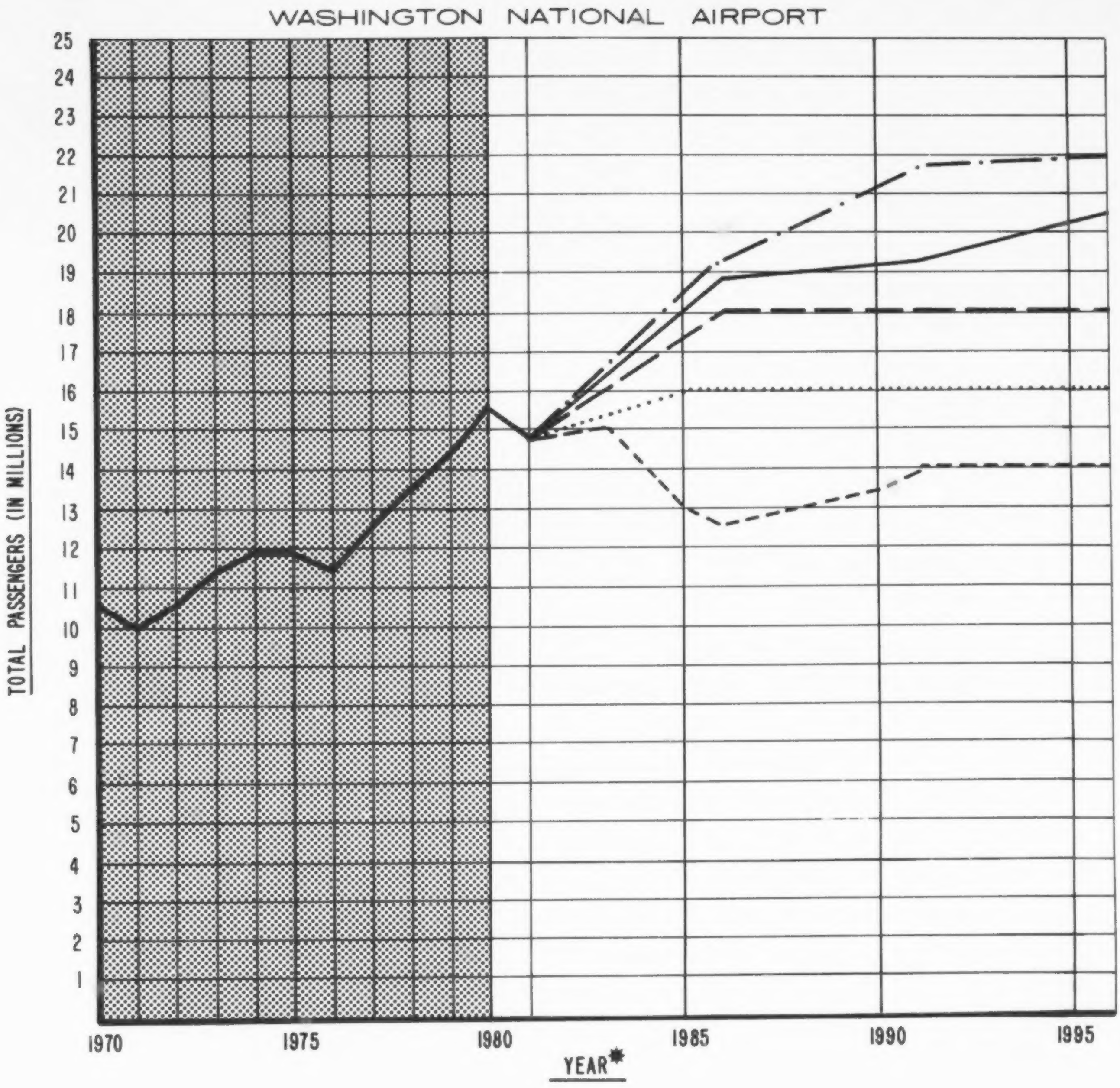
Once the total regional forecast had been selected, it was disaggregated to each airport in the system under each policy based on an allocation formula. This was done by initially allocating demand to National until either the stated policy passenger capacity was reached or the airport reached saturation under slot restrictions and fleet mix assumptions. For those alternatives under which general aviation passengers would be included in the passenger limit, a separate forecast of general aviation passengers was made and added into the model. Under each alternative, those passengers "turned away" from National due to policy limits (either set or implied) were established.

These "turned away" passengers were then either allocated to Dulles or Baltimore-Washington, i.e., added to their forecast activity based on a percentage share captured by each. The forecasts were then checked to see that they did not produce capacity constraints at any of the airports. When any capacity constraints were anticipated, they are discussed in Section III of this report.

After passenger forecasts were completed, operational forecasts were made for air carriers and commuters. Operational forecasts were based on fleet mix assumptions and load factor forecasts. At National, operations were adjusted to reflect slot allocation and perimeter limits set for each policy alternative. At Dulles and Baltimore-Washington, operations were adjusted to reflect the special role each airport will play in the total regional


DULLES INTERNATIONAL AIRPORT
TOTAL PASSENGERS (IN MILLIONS)
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
1970
1975
1980
1985
1990
1995
YEAR*


BALTIMORE-WASHINGTON INTERNATIONAL AIRPORT
TOTAL AIR CARRIER AND COMMUTER PASSENGERS (IN MILLIONS)
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
1970
1975
1980
1985
1990
1995
YEAR*



NOTE: JAN. 1981 - EARLIEST DATE TO IMPLEMENT MWA POLICY

– – – – – –	REDUCED ACTIVITY AT NATIONAL
—— · ——	EXPANDED GROWTH AT NATIONAL
————	NO POLICY CHANGE AT NATIONAL
—— ——	CONTROLLED GROWTH TO 18 MILLION AT NATIONAL
…………	CONTROLLED GROWTH TO 16 MILLION AT NATIONAL
━━━━	HISTORICAL ACTIVITY
*	DATES DENOTE JANUARY 1st OF YEAR INDICATED

METROPOLITAN WASHINGTON AIRPORTS

FINAL ENVIRONMENTAL IMPACT STATEMENT

PASSENGER FORECASTS

EXHIBIT II-6

TABLE II-4

PASSENGER FORECAST[a]
NO POLICY CHANGE

AIRPORT	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	TOTAL
		1979 EXISTING		
DCA	14,277,825	632,578	223,614	15,134,017
IAD	3,311,965	26,587	124,298	3,462,850
BWI	3,771,219 [b]	N/A	93,214	3,864,433
REGIONAL TOTAL	21,361,009[b]	659,165[c]	441,126	22,461,300
		1985		
DCA	17,872,000	792,000	225,000*	18,889,000
IAD	4,558,000	30,000	N/F	4,588,000
BWI	5,525,000	287,000	N/F	5,812,000
REGIONAL TOTAL	27,955,000	1,109,000	N/F	29,064,000*
		1990		
DCA	17,971,000	1,000,000	240,000*	19,211,000
IAD	9,395,000	32,000	N/F	9,427,000
BWI	8,542,000	396,000	N/F	8,938,000
REGIONAL TOTAL	35,908,000	1,428,000	N/F	37,336,000*
		1995		
DCA	19,037,000	1,250,000	260,000*	20,547,000
IAD	11,727,000	42,000	N/F	11,769,000
BWI	10,828,000	502,000	N/F	11,330,000
REGIONAL TOTAL	41,592,000	1,794,000	N/F	43,386,000*

[a] Does not include military passengers.
[b] Includes air taxi/commuter at BWI.
[c] Does not include commuter at BWI.
*General Aviation not included in Regional Total.
N/A - Not available.
N/F - Not forecasted.

TABLE II- 5
PASSENGER FORECAST[a]
EXPANDED GROWTH AT NATIONAL

1979 EXISTING

AIRPORT	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	TOTAL
DCA	14,277,825	632,578	223,614	15,134,017
IAD	3,311,965	26,587	124,298	3,462,850
BWI	3,771,219 [b]	N/A	93,214	3,864,433
REGIONAL TOTAL	21,361,009[b]	659,165[c]	441,126	22,461,300
		1985		
DCA	18,255,000	715,000	225,000*	19,195,000
IAD	4,423,000	30,000	N/F	4,453,000
BWI	5,354,000	287,000	N/F	5,641,000
REGIONAL TOTAL	28,032,000	1,032,000	N/F	29,064,000*
		1990		
DCA	20,656,000	860,000	230,000*	21,746,000
IAD	7,868,000	32,000	N/F	7,900,000
BWI	7,524,000	396,000	N/F	7,920,000
REGIONAL TOTAL	36,048,000	1,288,000	N/F	37,336,000*
		1995		
DCA	20,682,000	1,000,000	250,000*	21,932,000
IAD	10,890,000	42,000	N/F	10,932,000
BWI	10,270,000	502,000	N/F	10,772,000
REGIONAL TOTAL	41,842,000	1,544,000	N/F	43,386,000*

[a] Does not include military passengers.
[b] Includes air taxi/commuter at BWI.
[c] Does not include commuter at BWI.
*General Aviation not included in Regional Total.
N/A - Not available.
N/F - Not forecasted.

TABLE II-6

PASSENGER FORECAST[a]
CONTROLLED GROWTH TO 18 MILLION PASSENGERS AT NATIONAL

1979 EXISTING

AIRPORT	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	TOTAL
DCA	14,277,825	632,578	223,614	15,134,017
IAD	3,311,965	26,587	124,298	3,462,850
BWI	3,771,219[b]	N/A	93,214	3,864,433
REGIONAL TOTAL	21,361,009[b]	659,165[c]	441,126	22,461,300
		1985		
DCA	16,894,000	881,000	225,000*	18,000,000**
IAD	5,091,000	30,000	N/F	5,121,000
BWI	5,881,000	287,000	N/F	6,168,000
REGIONAL TOTAL	27,866,000	1,198,000	N/F	29,064,000*
		1990		
DCA	16,515,000	1,250,000	235,000*	18,000,000**
IAD	10,119,000	32,000	N/F	10,151,000
BWI	9,024,000	396,000	N/F	9,420,000
REGIONAL TOTAL	35,658,000	1,678,000	N/F	37,336,000*
		1995		
DCA	16,160,000	1,600,000	240,000*	18,000,000**
IAD	13,243,000	42,000	N/F	13,285,000
BWI	11,839,000	502,000	N/F	12,341,000
REGIONAL TOTAL	41,242,000	2,144,000	N/F	43,386,000*

[a] Does not include military passengers.
[b] Includes air taxi/commuter at BWI.
[c] Does not include commuter at BWI.
*General Aviation not included in Regional Total.
**Target - not to be exceeded.
N/A - Not available.
N/F - Not forecasted.

TABLE II-7

PASSENGER FORECAST[a]
CONTROLLED GROWTH TO 16 MILLION PASSENGERS AT NATIONAL

1979 EXISTING

AIRPORT	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	TOTAL
DCA	14,277,825	632,578	223,614	15,134,017
IAD	3,311,965	26,587	124,298	3,462,850
BWI	3,771,219	N/A	93,214	3,864,433
REGIONAL TOTAL	21,361,009[b]	659,165[c]	441,126	22,461,300
		1985		
DCA	14,894,000	881,000	225,000*	16,000,000**
IAD	6,291,000	30,000	N/F	6,321,000
BWI	6,681,000	287,000	N/F	6,968,000
REGIONAL TOTAL	27,866,000	1,198,000	N/F	29,064,000*
		1990		
DCA	14,515,000	1,250,000	235,000*	16,000,000**
IAD	11,319,000	32,000	N/F	11,351,000
BWI	9,824,000	396,000	N/F	10,220,000
REGIONAL TOTAL	35,658,000	1,678,000	N/F	37,336,000*
		1995		
DCA	14,160,000	1,600,000	240,000*	16,000,000**
IAD	14,443,000	42,000	N/F	14,458,000
BWI	12,639,000	502,000	N/F	13,141,000
REGIONAL TOTAL	41,242,000	2,144,000	N/F	43,386,000*

[a] Does not include military passengers.
[b] Includes air taxi/commuter at BWI.
[c] Does not include commuter at BWI.
*General Aviation not included in Regional Total
**Target - not to be exceeded.
N/A - Not available.
N/F - Not forecasted.

TABLE II- 8

PASSENGER FORECAST[a]
REDUCED ACTIVITY AT NATIONAL

1979 EXISTING

AIRPORT	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	TOTAL
DCA	14,277,825	632,578	223,614	15,134,017
IAD	3,311,965	26,587	124,298	3,462,850
BWI	3,771,219[b]	N/A	93,214	3,864,433
REGIONAL TOTAL	21,361,009[b]	659,165[c]	441,126	22,461,300
		1985		
DCA	11,586,000	850,000	225,000*	12,661,000
IAD	8,295,000	30,000	N/F	8,325,000
BWI	8,016,000	287,000	N/F	8,303,000
REGIONAL TOTAL	27,897,000	1,167,000	N/F	29,064,000*
		1990		
DCA	12,660,000	1,100,000	240,000*	14,000,000**
IAD	12,522,000	32,000	N/F	12,554,000
BWI	10,626,000	396,000	N/F	11,022,000
REGIONAL TOTAL	35,808,000	1,528,000	N/F	37,336,000*
		1995		
DCA	12,340,000	1,400,000	260,000*	14,000,000**
IAD	15,655,000	42,000	N/F	15,697,000
BWI	13,447,000	502,000	N/F	13,949,000
REGIONAL TOTAL	41,442,000	1,944,000	N/F	43,386,000*

[a] Does not include military passengers.
[b] Includes air taxi/commuter at BWI.
[c] Does not include commuter at BWI.
*General Aviation not included in Regional Total.
**Target - not to be exceeded.
N/A - Not available.
N/F - Not forecasted.

system. Finally, each airport was checked to see if there were physical limits (runway/taxiway/apron area limits) which would affect the operational mix.

Operational forecasts at National for general aviation were made based on forecasts of general aviation passengers. At Baltimore-Washington and Dulles, general aviation operations from the current master plans for each airport were used directly, as were forecasts of military activity.

The basic operational forecasts utilized in this environmental analysis are shown in Tables II-9 through II-11.

TABLE II-9

WASHINGTON NATIONAL AIRPORT
AIRCRAFT OPERATIONS FORECAST

	Existing Conditions[b]	No Policy Change	Expanded Growth at National	Controlled Growth to 18 Million at National	Controlled Growth to 16 Million at National	Reduced Activity at National
AIR CARRIER[a]	1979	1990	1990	1990	1990	1990
Operations per day:						
2 Engine Large Turboprop	38	-	-	-	-	-
2 Engine Narrow Body	254	155	151	118	103	34
3 Engine Narrow Body	334	511	343	208	178	56
4 Engine Narrow Body	-	-	-	-	-	-
2 Engine Widebody	-	-	122	132	112	163
3 Engine Widebody	-	-	30	22	22	28
4 Engine Widebody	-	-	-	-	-	-
SST	-	-	-	-	-	-
Total Air Carrier Ops/Day	626	666	646	480	415	281
Total Air Carrier Ops/Year	208,000	243,000	226,000	175,000	147,000	101,000
COMMUTER						
Total Operations per Day	145	133	126	200	200	266
Total Operations per Year	48,000	49,000	46,000	73,000	73,000	97,000
GENERAL AVIATION						
Total Operations per Day	260	263	262	268	268	274
Total Operations per Year	95,000	100,000	96,000	98,000	98,000	100,000
TOTALS						
Combined Operations per Day	1,031	1,062	1,034	948	883	821
Combined Operations per Year	351,000	338,000	368,000	346,000	318,000	298,000

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[a] Includes scheduled as well as extra sections.

[b] Operations per day based on actual data for a weekday in August, 1979. Total Operations per Year are those for Fiscal Year ending September, 1979.

TABLE II-10

DULLES INTERNATIONAL AIRPORT
AIRCRAFT OPERATIONS FORECAST

	Existing Conditions[a]	No Policy Change	Expanded Growth at National	Controlled Growth to 18 Million at National	Controlled Growth to 16 Million at National	Reduced Activity at National
AIR CARRIER	1979	1990	1990	1990	1990	1990
Operations per day:						
2 Engine Narrow Body	24	34	36	46	43	36
3 Engine Narrow Body	48	63	72	102	114	125
4 Engine Narrow Body	52	38	38	38	40	44
2 Engine Widebody	-	52	38	50	64	69
3 Engine Widebody	24	50	40	48	57	73
4 Engine Widebody	6	10	10	10	10	11
SST	4	6	6	6	6	6
Total Air Carrier Ops/Day	158	253	240	300	334	364
Total Air Carrier Ops/Year	56,000	92,000	88,000	110,000	121,000	132,000
COMMUTER						
Total Operations per Day	14	25	25	25	25	25
Total Operations per Year	8,000	9,000	9,000	9,000	9,000	9,000
GENERAL AVIATION						
Total Operations per Day	290	425	425	425	425	425
Total Operations per Year	103,000	155,000	155,000	155,000	155,000	155,000
MILITARY						
Total Operations per Day	24	25	25	25	25	25
Total Operations per Year	9,000	9,000	9,000	9,000	9,000	9,000
TOTALS						
Combined Operations per Day	485	728	715	775	809	839
Combined Operations per Year	175,000	265,000	261,000	283,000	294,000	305,000

---

[a] Operations per day based on actual data for a weekday in August, 1979. Total Operations per Year are those for Fiscal Year ending 9/79.

TABLE II-11

BALTIMORE-WASHINGTON INTERNATIONAL AIRPORT AIRCRAFT OPERATIONS FORECAST

	Existing Conditions[a]	No Policy Change	Expanded Growth at National	Controlled Growth to 18 Million at National	Controlled Growth to 16 Million at National	Reduced Activity at National
AIR CARRIER	1979	1990	1990	1990	1990	1990
Operations per day:						
2 Engine Narrow Body	100	100	105	107	127	131
3 Engine Narrow Body	72	103	99	110	123	127
4 Engine Narrow Body	18	14	14	14	17	18
2 Engine Widebody	-	34	28	37	34	32
3 Engine Widebody	6	31	28	34	38	39
4 Engine Widebody	-	3	3	4	3	7
SST	-	-	-	-	-	-
Total Air Carrier Ops/Day	196	285	277	306	342	354
Total Air Carrier Ops/Year	68,000	104,000	101,000	112,000	125,000	129,000
COMMUTER						
Total Operations per Day	126	152	152	152	152	152
Total Operations per Year	48,000	55,000	55,000	55,000	55,000	55,000
GENERAL AVIATION						
Total Operations per Day	265	420	420	420	420	420
Total Operations per Year	99,000	153,000	153,000	153,000	153,000	153,000
MILITARY						
Total Operations per Day	12	11	11	11	11	11
Total Operations per Year	4,000	4,000	4,000	4,000	4,000	4,000
TOTALS						
Combined Operations per Day	598	868	860	889	925	937
Combined Operations per Year	219,000	316,000	314,000	324,000	338,000	342,000

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[a] Operations per day based on actual data for a weekday in August, 1979. Total Operations per Year are those for Fiscal Year ending 9/79.

SECTION III: PRESENT CONDITIONS AND IMPACTS OF POLICY ALTERNATIVES

INTRODUCTION

This section of the report presents a summary of the existing conditions at Washington National Airport, Dulles International Airport, and Baltimore-Washington International Airport and also presents an analysis of the environmental impacts that are likely to occur at each airport resulting from the various policy alternatives. The impacts evaluated in this section include Noise, Air Quality, Surface Access, Social, and Economic Impacts, Park Lands and Historic Sites, Energy, Airline Service, and Natural Systems.

WASHINGTON NATIONAL AIRPORT

NOISE

Introduction and Methodology

The noise descriptors and methodology used to determine the impacts of noise for each alternative under evaluation are summarized below:

> Day/Night Average Sound Level (Ldn) - A noise measure which combines the effects of peak noise levels, number of aircraft operations (takeoffs and landings), and time of day of operations into one noise descriptor. One nighttime operation under this descriptor is assumed to be perceived as the same noise impact as 10 operations occurring in the daytime. The resulting noise measure can be compared to noise/land use guidance provided in Table III-1.
>
> Noise Exposure Forecast (NEF) - A noise measure which combines the same parameters as the Ldn, but assumes a larger nighttime weighting of aircraft operations. The resulting noise measure can also be compared to guidance provided in Table III-1.
>
> Time Above (TA) - A noise metric which gives the time of exposure above a given threshold. Typical threshold values used are 65, 75, 85, 95, 105 and 115 dBA. Table III-2 describes typical dBA sound levels commonly experienced by people.

Each of these noise descriptors provides a measure of the total aircraft-generated noise received at designated locations

TABLE III-1

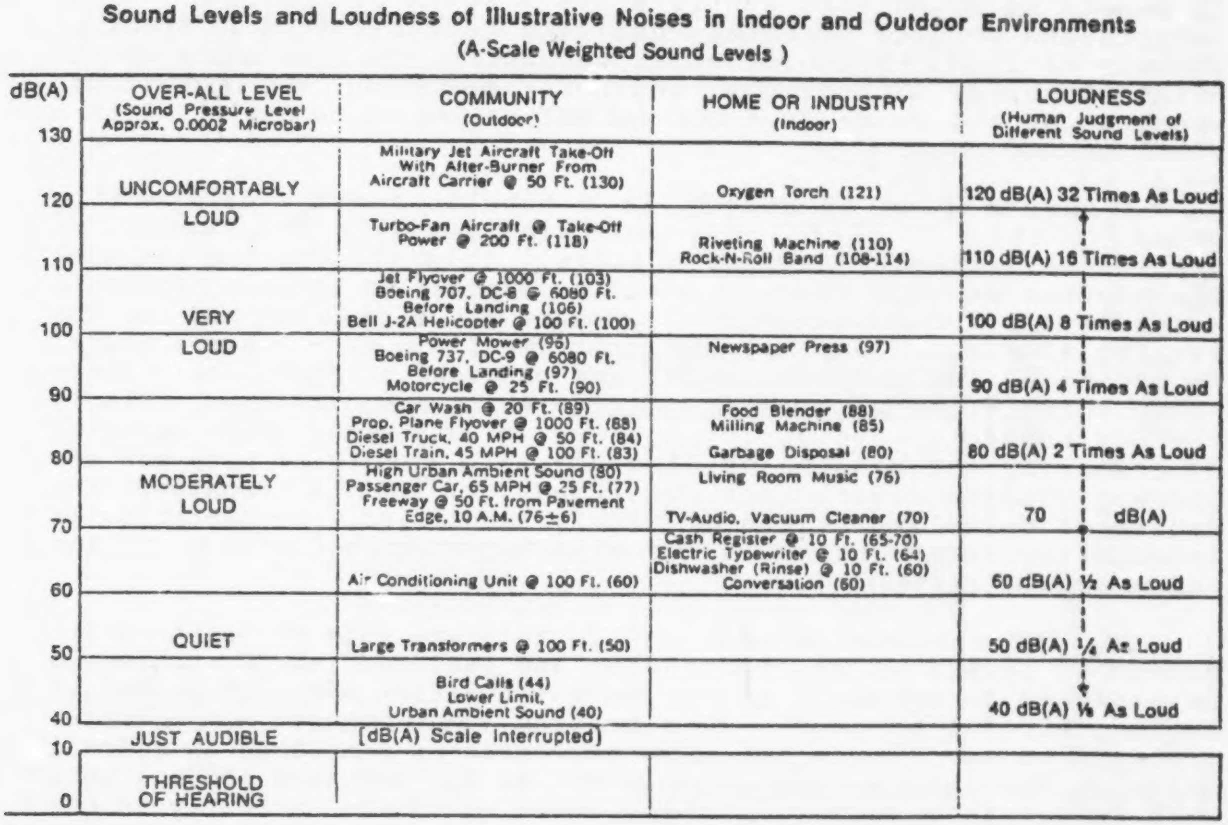
LAND USES ADJACENT TO AIRPORTS
(BASED ON NEF AND Ldn NOISE CONTOURS)

NEF Values (Ldn Values)	Remarks
20 - 30 (55 - 65)	Few activities will be affected by aircraft sounds, although building designs for especially sound sensitive activities such as auditoriums, churches, schools, hospitals, and theaters should consider sound control in areas closest to the airport. Detailed studies by qualified personnel are recommended for outdoor amphitheaters and like places of public assembly in the general vicinity of the airport.
30 - 40 (65 - 75)	Activities where uninterrupted communication is essential should consider sound exposure in design. Generally, residential development is not considered a suitable use although multi-family developments where sound control features have been incorporated in building design must be considered. Open-air activities and outdoor living will be affected by aircraft sound. The construction of auditoriums, schools, churches, hospitals, and theatres and like activities should be avoided within the zone where possible.
Greater than 40 (Greater than 75)	Land should be reserved for activities that can tolerate a high level of sound exposure such as some agricultural, industrial, and commercial uses. No residential developments of any type are recommended. Sound sensitive activities such as schools, offices, hospitals, churches and like activities should not be constructed in this area unless no alternative location is possible. All regularly-occupied structures should consider sound control in design.

Source: Taken from FAA publication Airport Master Plans.

TABLE III-2

SOUND LEVELS (dBA) AND LOUDNESS OF ILLUSTRATIVE NOISES IN INDOOR AND OUTDOOR ENVIRONMENTS



Sound Levels and Loudness of Illustrative Noises in Indoor and Outdoor Environments

(A-Scale Weighted Sound Levels)

dB(A)	OVER-ALL LEVEL (Sound Pressure Level Approx. 0.0002 Microbar)	COMMUNITY (Outdoor)	HOME OR INDUSTRY (Indoor)	LOUDNESS (Human Judgment of Different Sound Levels)
130				
120	UNCOMFORTABLY	Military Jet Aircraft Take-Off With After-Burner From Aircraft Carrier @ 50 Ft. (130)	Oxygen Torch (121)	120 dB(A) 32 Times As Loud
110	LOUD	Turbo-Fan Aircraft @ Take-Off Power @ 200 Ft. (118)	Riveting Machine (110) Rock-N-Roll Band (108-114)	110 dB(A) 16 Times As Loud
100	VERY	Jet Flyover @ 1000 Ft. (103) Boeing 707, DC-8 @ 6080 Ft. Before Landing (106) Bell J-2A Helicopter @ 100 Ft. (100)		100 dB(A) 8 Times As Loud
90	LOUD	Power Mower (96) Boeing 737, DC-9 @ 6080 Ft. Before Landing (97) Motorcycle @ 25 Ft. (90)	Newspaper Press (97)	90 dB(A) 4 Times As Loud
80		Car Wash @ 20 Ft. (89) Prop. Plane Flyover @ 1000 Ft. (88) Diesel Truck, 40 MPH @ 50 Ft. (84) Diesel Train, 45 MPH @ 100 Ft. (83)	Food Blender (88) Milling Machine (85) Garbage Disposal (80)	80 dB(A) 2 Times As Loud
70	MODERATELY LOUD	High Urban Ambient Sound (80) Passenger Car, 65 MPH @ 25 Ft. (77) Freeway @ 50 Ft. from Pavement Edge, 10 A.M. (76±6)	Living Room Music (76) TV-Audio, Vacuum Cleaner (70)	70 dB(A)
60		Air Conditioning Unit @ 100 Ft. (60)	Cash Register @ 10 Ft. (65-70) Electric Typewriter @ 10 Ft. (64) Dishwasher (Rinse) @ 10 Ft. (60) Conversation (60)	60 dB(A) ½ As Loud
50	QUIET	Large Transformers @ 100 Ft. (50)		50 dB(A) ¼ As Loud
40		Bird Calls (44) Lower Limit, Urban Ambient Sound (40)		40 dB(A) ⅛ As Loud
10	JUST AUDIBLE	[dB(A) Scale Interrupted]		
0	THRESHOLD OF HEARING			

Source: Melville C. Branch, et al., Outdoor Noise and the Metropolitan Environment, (Los Angeles: Department of City Planning, 1970), p. 2.

over a typical 24-hour period.[1]

The noise model used to develop noise values and contours in this FEIS was the FAA Integrated Noise Model.

The output from the computer program is presented in two manners. One is the graphical output of contours of equal noise exposure, such as NEF 30 and NEF 40. Contours are suitable for providing comparisons between different projected conditions, provided that basic assumptions and data are consistent in all calculations. Areas, land uses and population within certain contours can be quantified to provide a comparison between alternative scenarios. It should be noted that contours are a means of comparing noise impacts and not for precisely defining them relative to specific parcels of land. Many variables can affect the size and shape of noise contours. Topography, weather, vegetation, and operational changes can all cause contours and NEF values to be different than under assumed conditions.

A second form of output is a tabular summary at specific points. This is useful for providing detailed information at representative noise-sensitive sites. This information includes the minutes per day the site would be exposed to various threshold noise levels. These minutes of exposure are also presented for the evening (7 p.m. - 10 p.m.) and nighttime (10 p.m. - 7 a.m.) hours. In addition, Ldn and NEF values are provided at each site. These noise identifiers are used by some reviewing agencies (particularly the Environmental Protection Agency) in assessing noise impacts. By comparing the minutes of exposure at a sensitive site for the present condition with that resulting from each alternative, the degree of noise impact can be clearly identified. Presentation of information in this form is normally most understandable to the non-technical reviewer.

The INM computer program used in this analysis contains information on levels of aircraft noise and includes levels that would be expected as a result of the Federal Aviation Administration jet engine retrofit program. This program requires all air carrier aircraft to meet stringent noise standards as described in Federal Aviation Regulation (FAR) Part 36 by the mid and late 1980s. This will result in a number of old, louder aircraft currently in the airline fleets being re-engined, retired, or modified (retrofitted), typically with quieter engine nacelles. In addition, aircraft of future design that will be joining the airline fleets in the 1980s will be required to meet even more stringent noise standards under Federal Aviation Regulation (FAR) Part 36. Exhibit III-1 shows the noise levels of typical aircraft that either comply

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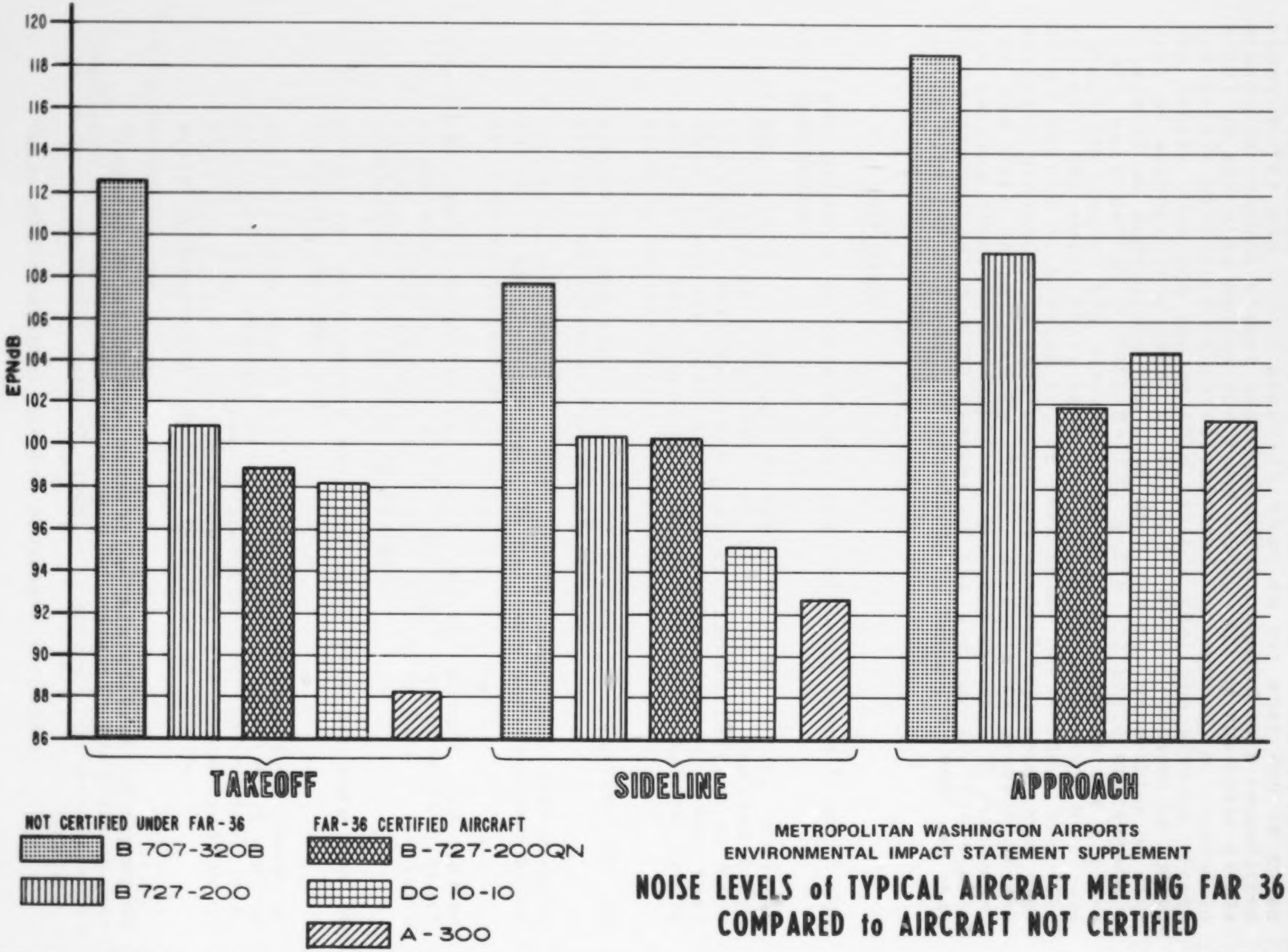
[1] See FAA publication, Impact of Noise on People, available upon request to the Director, Office of Environment and Energy, Federal Aviation Administration, 800 Independence Avenue, S.W., Washington, D.C. 20591.



METROPOLITAN WASHINGTON AIRPORTS
ENVIRONMENTAL IMPACT STATEMENT SUPPLEMENT

NOISE LEVELS of TYPICAL AIRCRAFT MEETING FAR 36 COMPARED to AIRCRAFT NOT CERTIFIED

SOURCE: FAA ADVISORY CIRCULARS 36-2A and 36-1B

EXHIBIT III-1

or do not comply with FAR 36 noise standards. As can be seen, the older B-727 and B-707 aircraft that do not meet FAR 36 noise standards produce higher noise levels as compared to a retrofitted B-727 or the wide bodied DC-10 and A-300. All of the older B-727s and B-707s will need to be retrofitted, re-engined, or retired in the 1980s. One can see on this exhibit that the airline fleets will be measurably quieter by the mid-1980s as compared to today. This will be especially the case when the new generation of aircraft such as the A-300, B-757, and B-767 begin to replace a larger portion of the aircraft currently serving in the airline fleets. The noise characteristics of the new generation B-757 and B-767 should be similar to, or less than, the A-300. The 1990 analysis presented in this report has assumed full compliance with the FAR Part 36 program by 1990. Currently 42 percent of the air carrier fleet is in compliance with the FAR Part 36 standards. It is projected that 87 percent of the air carrier fleet will comply with the FAR Part 36 standards by January 1, 1985 and that all will comply by 1988.[1]

Assumptions

For purposes of this study, the following overall conditions have been assumed:

* Approaches are assumed to follow the centerline of flight corridors shown on Exhibit III-2 with a reduced flaps approach. This involves partial flap deflection at 3,000 feet altitude and full flap deflection at 1,000 feet altitude. Departures are assumed to follow takeoff tracks shown on Exhibit III-2;

* The noise abatement procedure currently specified for jet aircraft at National Airport is assumed;[2]

* For present conditions, only partial compliance with Federal Aviation Regulations Part 36 has been achieved for older air carrier aircraft;

* For future conditions, all air carrier aircraft are assumed to be new models or older equipment equipped with quiet nacelle modifications in order to comply with noise level requirements of FAR Part 36 by 1990;

* Noise and performance data for each aircraft were used as stored in the INM; and

* For existing conditions, it is assumed that even though no air carrier turbojet service is scheduled after 10 p.m. or before 7 a.m., a number of operations during the 10-11 p.m. hour normally occur as a result of the concentration of arrivals/departures scheduled before or at 10 p.m.;

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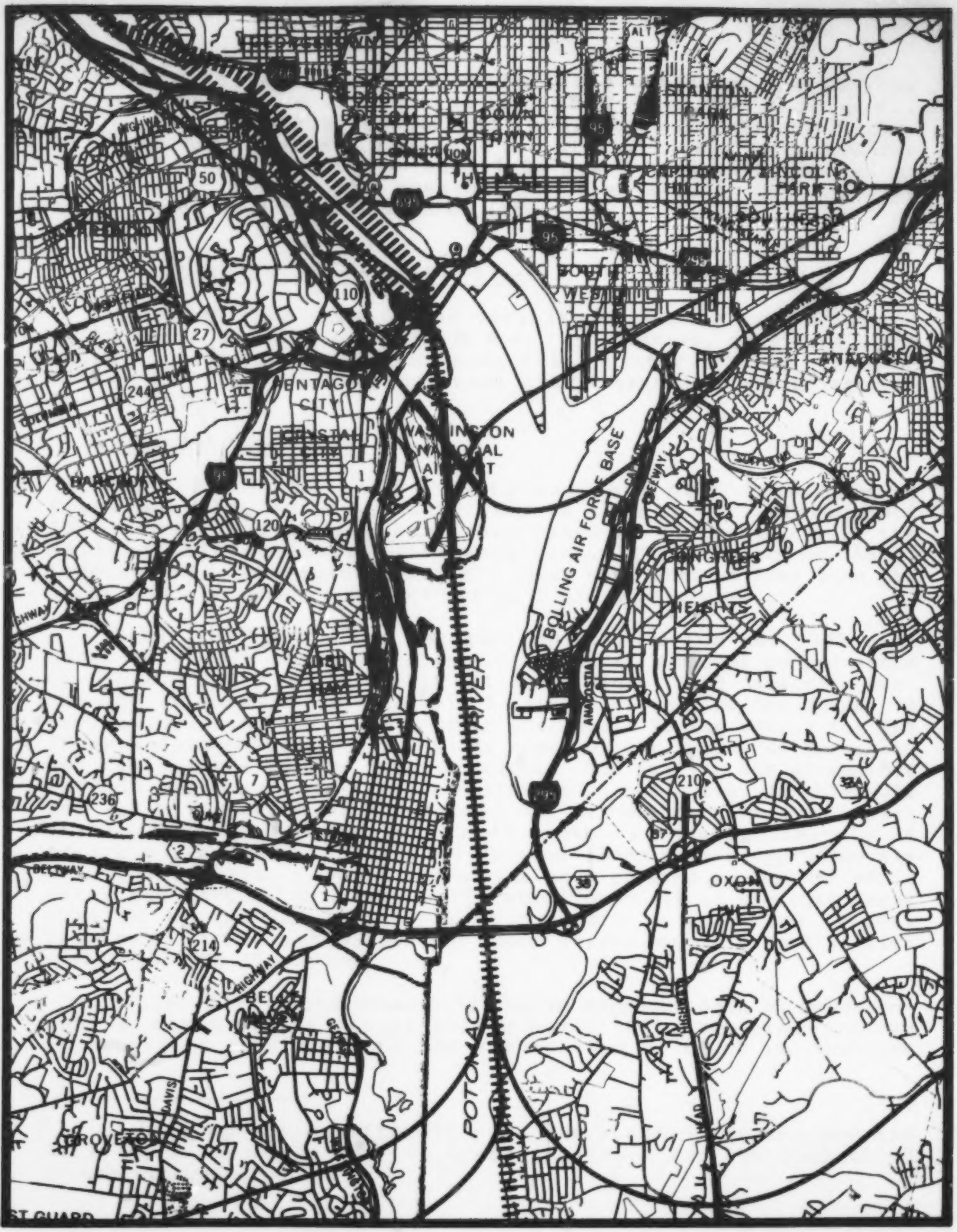
[1] Federal Aviation Administration Administration Report on compliance with noise standards by U.S. Domestic Aircraft Operators, Federal Register, July 17, 1980.

[2] Washington National Airport Abatement Procedure.


GEORGETOWN
FOGGY BOTTOM
DOWNTOWN
STANTON PARK
CAPITOL HILL
LINCOLN PARK
SOUTHWEST
THE MALL
PENTAGON CITY
CRYSTAL CITY
WASHINGTON NATIONAL AIRPORT
BOLLING AIR FORCE BASE
ANACOSTIA
CONGRESS HEIGHTS
POTOMAC RIVER
OXON HILL
BELLE HAVEN
GROVETON
266
95
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27
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LEGEND

TAKEOFF ——

LANDING ||||||||

METROPOLITAN WASHINGTON AIRPORTS
ENVIRONMENTAL IMPACT STATEMENT SUPPLEMENT

FLIGHT TRACKS-NATIONAL AIRPORT

EXHIBIT III-2

* For the alternatives which limit scheduled air carrier operations to the hours of 7 a.m. to 9:30 p.m., all air carrier operations should be concluded by 10 p.m. on most nights. However, one or two nighttime operations (between 10:00 p.m. and 11:00 p.m.) have been assumed to occur due to the possibility of an arrival or departure being more than 30 minutes late.[1]

Land Use and Sensitive Sites

Existing land uses in the vicinity of National are presented in Appendix Exhibits A-1 through A-6. In addition, sensitive sites including schools, churches, hospitals, historic sites, residential, parks, and recreation areas are presented on all noise contour exhibits.

Existing Conditions

The 1979 conditions at National have been developed to represent the "existing" condition in this report. Throughout 1979, noise monitoring has taken place at 15 locations in the National Airport noise influence area. This monitoring data, together with the latest aircraft data, were used to fine tune the noise model to closely reflect actual field conditions.

Table II-9 lists the aircraft operations for the 1979 base case. The 1979 base case noise situation at National is presented on Exhibit III-3 and in Table III-3. Exhibit III-3 indicates that the NEF 30 extends approximately 8 miles northwest of the Runway 18 threshold, along the Potomac River corridor. To the south, the NEF 30 extends approximately 5.7 miles south of the Runway 36 threshold and follows the Potomac River corridor. The smaller NEF 40 contour extends approximately 2 miles northwest of the Runway 18 threshold and 2.8 miles south of the Runway 36 threshold. The total area covered by the NEF 30 and NEF 40 contours is approximately 26 square miles, while the NEF 40 contour alone covers approximately 4.4 square miles. Almost all of the area covered by the NEF 40 is water and airport property while about one-half of the total area covered by the NEF 30 and NEF 40 contours is water and airport property. It is estimated that about 75,000 people presently live within the NEF 30 contour.

Table III-3 lists Ldn and NEF noise exposure data at representative sites within the airport's noise influence area. Those sites listed show that the NEF ranges from 23 to 46 and that the

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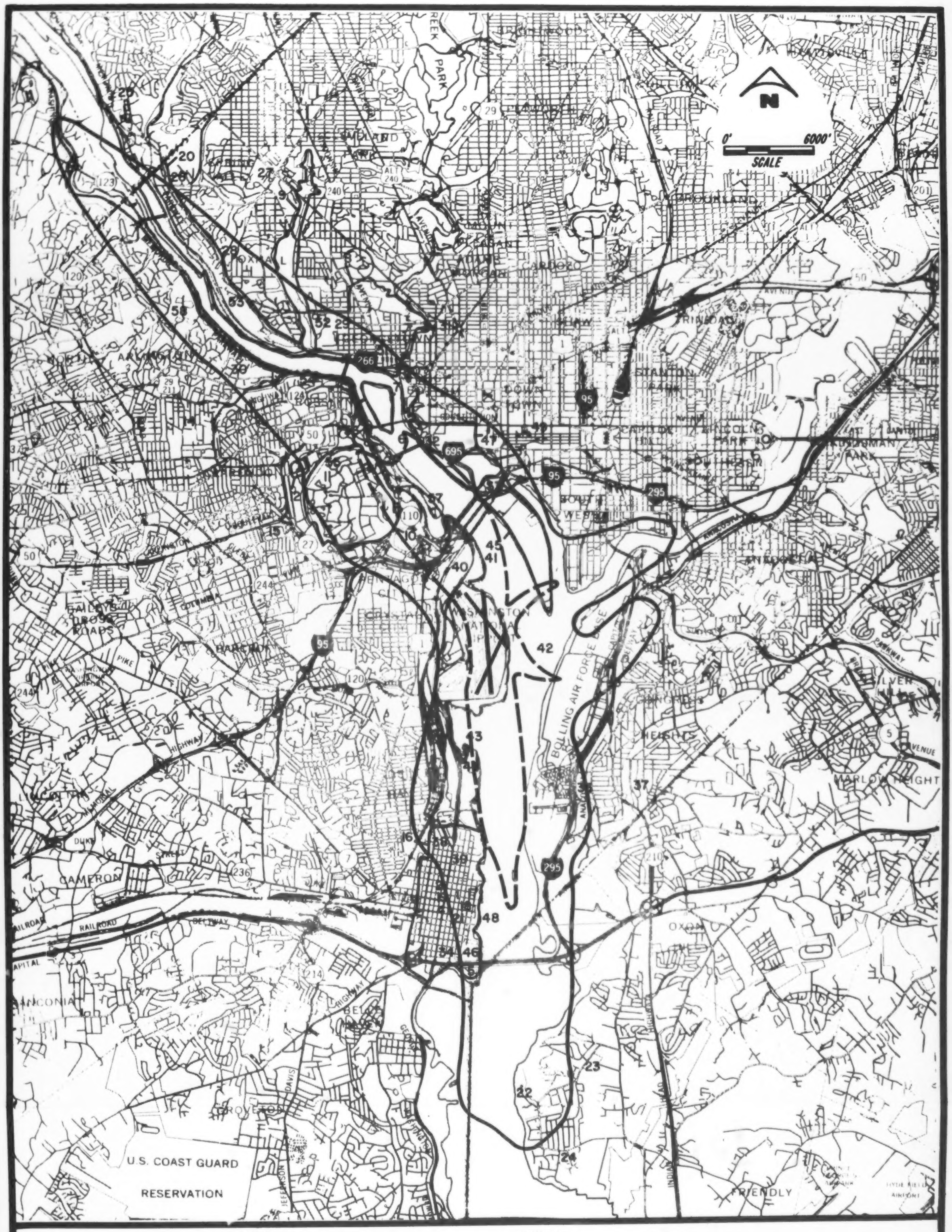
[1] One operation after 10 p.m. was assumed for the Reduced Activity alternative and two operations each for the Controlled Growth alternatives.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U.S. COAST GUARD
RESERVATION
BOLLING AIR FORCE BASE
PARK
CARDOZO
STANTON PARK
LINCOLN PARK
CAPITOL HILL
DOWNTOWN
SOUTHWEST
ANACOSTIA
HEIGHTS
MARLOW HEIGHTS
OXON
FRIENDLY
CAMERON
GROVETON
BAILEYS CROSS ROADS
ARLINGTON
PIKE
HIGHWAY
RAILROAD
BELTWAY
JEFFERSON
DAVIS
DUKE
COLUMBIA
AVENUE
PARKWAY
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LEGEND

HISTORIC SITES

1. GADSBY'S TAVERN
2. LLOYD HOUSE
3. TIDAL BASIN
4. THE LYCEUM
5. JONES POINT LIGHTHOUSE
6. ARLINGTON MEMORIAL BRIDGE
7. THEODORE ROOSEVELT ISLAND
8. GEORGETOWN HISTORIC DISTRICT
9. GLOVER ARCHIBALD PARKWAY
10. ARLINGTON NATIONAL CEMETERY
11. ARLINGTON HOUSE and ROBERT E. LEE MEMORIAL
12. FT. MYER HISTORIC DISTRICT
13. DOUBLEDAY MANSION
14. THE GLEBE
15. C. R. DREW HOUSE
16. ALEXANDRIA HISTORIC DISTRICT
17. BANK OF ALEXANDRIA
18. CARLYLE HOUSE
19. CHRIST CHURCH
20. POTOMAC GORGE and C & O CANAL

REPRESENTATIVE SENSITIVE SITES

21. ST. MARY'S CHURCH
22. FORT FOOTE PARK
23. FT. FOOTE BAPTIST CHURCH
24. INDIAN QUEEN SCHOOL
25. BROOKMONT SCHOOL
26. SIBLEY HOSPITAL
27. AMERICAN UNIVERSITY
28. ST. JOHN'S CHILD DEVELOPMENT CENTER
29. GEORGETOWN UNIVERSITY
30. WOODMONT SCHOOL
31. COLUMBIA HOSPITAL
32. LINCOLN MEMORIAL
33. JEFFERSON MEMORIAL
34. ST. MARY'S SCHOOL
35. SYPHAX SCHOOL
36. HADLEY HOSPITAL
37. ST. THOMAS MORE SCHOOL
38. GRAY HIGH SCHOOL
39. ST. JOSEPH'S SCHOOL

PARKS AND RECREATION AREAS

40. WATERFOWL SANCTUARY
41. GRAVELLY POINT PARK
42. POTOMAC RIVER
43. MARINA
44. DAINGERFIELD ISLAND
45. EAST POTOMAC PARK
46. JONES POINT PARK
47. WEST POTOMAC PARK
48. POTOMAC VIEW PARK
49. THE MALL
50. ROCK CREEK AND POTOMAC PARKWAY
51. C & O CANAL
52. ARCHIBOLD PARKWAY
53. POTOMAC PALISADES PARKWAY
54. GEORGE WASHINGTON MEMORIAL PARKWAY
55. ARLINGTON HOUSE
56. IWO JIMA MEMORIAL
57. LADY BIRD JOHNSON PARK
58. NORTHERN VIRGINIA REGIONAL PARK

LEGEND

— NEF 30
– – NEF 40

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

NATIONAL AIRPORT
NEF CONTOURS
EXISTING CONDITIONS

EXHIBIT III-3

TABLE III-3

WASHINGTON NATIONAL AIRPORT
NOISE LEVELS AT REPRESENTATIVE SITES
RESULTING FROM AIRCRAFT OPERATIONS

	Sensitive Site No.[a]	Existing Conditions		No Policy Change		Expanded Growth Policy at National		Controlled Passenger Growth at National				Reduced Activity Policy at National	
								18 million		16 million			
		Ldn	NEF	Ldn	NEF	Ldn	NEF	Ldn	NEF	Ldn	NEF	Ldn	NEF
Historic Sites:													
Gadsby Tavern	1	76	39	75	38	74	38	71	34	70	33	67	30
Lloyd House	2	69	33	70	34	69	33	65	29	65	28	61	24
Tidal Basin	3	69	33	71	35	70	34	66	29	66	29	62	24
The Lyceum	4	69	33	70	34	69	33	65	29	65	28	61	24
Jones Point Lighthouse	5	73	37	73	37	72	36	69	32	69	32	65	28
Arlington Memorial Bridge	6	77	41	76	40	76	39	72	35	72	35	68	32
Theodore Roosevelt	7	75	38	75	38	74	38	71	34	70	33	66	30
Georgetown Historic Dist.	8	66	30	66	31	65	30	62	26	61	25	58	21
Glover Archibald Parkway	9	70	33	70	35	70	34	66	30	66	29	62	25
Arlington National Cemetery	10	68	31	69	33	68	32	65	28	64	27	60	23
Arlington House-Robert E. Lee Memorial	11	70	33	72	35	71	34	67	30	67	29	62	25
Ft. Myer Historic District	12	66	29	66	31	65	30	62	26	61	25	57	21
Doubleday Mansion	13	71	34	71	35	71	35	67	30	67	30	63	26
The Glebe	14	60	25	61	27	60	26	57	22	56	21	52	17
C.R. Drew House	15	61	25	62	27	61	26	57	22	57	21	53	17
Alexandria Historic Dist.	16	70	33	70	34	69	33	66	29	65	28	62	25
Bank of Alexandria	17	76	39	75	38	74	38	71	34	70	33	67	30
Carlyle House	18	76	39	75	38	74	38	71	34	70	33	67	30
Christ Church	19	69	33	70	34	69	33	65	29	65	28	61	24
Potomac Gorge and C & O Canal	20	71	35	72	36	71	35	68	31	67	30	63	26
Representative Sensitive Sites:													
St. Mary's Church	21	69	32	69	34	69	33	65	28	65	28	61	24
Fort Foote Park	22	68	31	68	33	68	32	64	28	64	27	60	23
Fort Foote Baptist Church	23	63	27	63	[illegible]	62	28	59	23	58	23	55	18
Indian Queen School	24	65	29	66	[illegible]	65	29	61	25	61	24	57	20
Brookmont School	25	65	29	66	30	65	30	62	25	61	25	57	21
Sibley Hospital	26	67	31	68	32	67	31	63	27	63	26	59	22
American University	27	61	25	61	27	60	26	57	21	56	21	52	17
St. John's Child Development Center	28	69	32	69	34	69	33	65	29	65	28	61	24
Georgetown University	29	69	32	69	33	68	32	65	28	64	28	60	24
Woodmont School	30	67	30	67	32	66	31	63	27	63	26	59	22
Columbia Hospital	31	61	25	61	27	60	26	57	22	56	21	52	17
Lincoln Memorial	32	73	36	74	38	73	37	70	33	69	32	65	28
Jefferson Memorial	33	72	35	74	37	73	36	69	32	69	31	64	27
St. Mary's School	34	69	32	69	33	68	33	65	28	64	28	61	24
Syphax School	35	70	33	71	34	70	33	67	29	66	29	63	25
Hadley Hospital	36	64	28	66	31	65	30	62	25	61	25	57	20
St. Thomas More School	37	58	23	59	25	58	24	55	20	54	19	50	15
Gray High School	38	68	31	70	34	69	33	65	28	65	28	60	23
St. Joseph's School	39	70	33	70	34	69	33	66	29	65	28	62	25
Park & Recreation Areas:													
Waterfowl Sanctuary	40	80	43	82	44	81	44	77	40	77	39	73	35
Gravelly Point Park	41	83	46	85	47	84	46	80	42	79	42	75	38
Potomac River	42	72	37	73	38	72	37	75	30	74	29	71	26
Marina	43	77	42	78	43	77	42	73	38	72	37	69	34
Daingerfield Island	44	80	42	81	44	80	43	76	39	76	38	71	34
East Potomac Park	45	76	38	77	40	76	39	73	35	72	34	68	31
Jones Point Park	46	73	37	73	37	72	36	69	32	69	32	65	28
West Potomac Park	47	78	42	79	42	78	42	75	37	74	37	70	33
Potomac View Park	48	74	38	74	38	74	37	70	33	70	33	66	29
The Mall	49	66	30	68	32	67	31	63	26	63	26	58	21
Rock Creek and Potomac Parkway	50	68	32	68	33	67	32	64	28	64	27	60	23
C & O Canal	51	69	32	69	33	68	32	65	28	64	28	61	24
Archibold Parkway	52	73	36	73	37	72	36	69	32	68	31	64	28
Potomac Palisades Parkway	53	71	35	72	36	71	35	68	31	67	30	63	26
George Washington Memorial Parkway	54	74	37	74	37	73	37	70	33	69	32	65	28
Arlington House	55	70	33	72	35	71	34	67	30	67	29	62	25
Iwo Jima Memorial	56	77	40	78	41	77	40	73	36	73	35	69	31
Lady Bird Johnson Park	57	78	41	80	43	79	42	75	38	75	37	70	33
Northern Virginia Regional Park	58	68	32	69	33	68	32	65	28	64	27	60	23
Cabin John	59	62	26	63	28	62	27	58	23	58	22	54	18

[a] See Exhibit III-3 for site location.

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Ldn ranges from 58 to 83. For locations not identified within Table III-3, the approximate levels of noise can be determined by locating the site in question on Exhibit III-3 and interpolating between the contours. See Table III-1 regarding land use considerations for ranges of cumulative noise exposure. Appendix Table A-1 lists time above information for each of the sites and indicates that during a 24-hour period the representative sites receive between 0 and 52 minutes of aircraft noise above 85 dBA while not appreciably exceeding 95 dBA except for a few sites close to the airport.

It should be mentioned that these 1979 "existing" contours result from aircraft operations which presently utilize several measures to minimize noise impact. The FAA has implemented the following current noise abatement controls at National:

* Restricting the scheduling of turbojets to certain hours - a voluntary restriction of air carrier jet schedules after 10 p.m. and before 7 a.m.;

* Limiting the number of scheduled operations per day - current airline quota of 40 scheduled operations per hour;

* Prohibiting certain aircraft - no air carrier four-engine jet aircraft;

* Aircraft operation - thrust reduction on takeoff and reduced flaps on approach; and

* Preferential approach and departure flight tracks -jet aircraft arrive and depart along the Potomac River corridor on both northwest and south approaches and departures[1].

Thus, the noise abatement steps described above have resulted in limiting the noise impact in the Washington, D. C. area. However, there still exists a noise problem under present conditions. There are residential areas, parks, historic, and institutional activities occurring within the NEF 30 contour. In addition, there are many residential areas outside of the NEF 30 contour where residents still find the level of aircraft noise and frequency of overflight as intrusive and annoying. It should be pointed out that increasing levels of cumulative noise exposure naturally

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[1] The Metropolitan Washington Council of Governments (COG) and the FAA are engaged in a cooperative study effort to evaluate and test alternative flight path configurations that may further reduce the impacts of aircraft noise on citizens in the Washington area. It is through this study effort that considerations will be given to changing existing flight paths and procedures. These test alternative flight paths have not been included in this analysis.

results in increased annoyance to a larger percentage of the population. In other words, a greater percentage of the population will be annoyed when exposed to a cumulative noise level of 30 NEF as compared to 20 NEF. However, there will always be citizens who consider a cumulative noise level of 20 NEF as unacceptable. In any case, one should never conclude that the NEF 30 contour represents a boundary outside of which no aircraft noise impacts occur. Perhaps the best use of noise information is to compare the relative difference in noise impact between the different policy alternatives rather than attempting to determine what level of noise should be considered acceptable or unacceptable. The relative changes in noise impact for each policy alternative as depicted by the noise model will also occur for areas far from the airport and outside of the noise contours.

Impacts of Policy Alternatives

The noise impacts from the various policy alternatives result from the combination of policy provisions, including aircraft and passenger quota restrictions, introduction of wide-body jets, and the amount of reduction in nighttime aircraft operations.

By 1990, a number of operational conditions would occur that would present different noise characteristics than now exist at National.

First, by 1990, the retrofit program described earlier would be totally in effect. The existing loud aircraft will have to meet more stringent noise standards. This will result in single event noise levels being lower than they are now. For example, a retrofitted B-727 will be quieter by about 2 EPNdB[1] on takeoff and 7 EPNdB on approach than a similar aircraft which has not been retrofitted.

Second, the introduction of the new generation of two- and three-engine aircraft, as provided for in all but the No Policy Change alternative, would change the composition of the aircraft fleet using the airport. These quieter aircraft would replace some of the more noisy aircraft that would otherwise use National. For example, the noise level from the new generation of A-300, B-757 and B-767 aircraft should be more than 10 EPNdB quieter on takeoff than from a retrofitted B-727. Most people will perceive the takeoff of one of these new generation aircraft as half as noisy as the retrofitted B-727. Moreover, these new generation aircraft are forecast to represent a large percentage of the air carrier operation at National by 1990 under all but the No Policy Change alternative.

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[1] EPNdB is the unit of Effective Perceived Noise Level (EPNL). EPNL is a calculated measure designed to estimate more precisely the effective "noisiness" of a single event, usually an aircraft flyover; taking into account corrections for pure tones and for the duration of the noise.

Third, the alternatives which provide for annual air passenger limitations at National and the continual rollback of air carrier slots to maintain those levels would result in a continued reduction in air carrier operations in the future. The reason for the continued slot rollbacks is that the high capacity of the new two- and three-engine aircraft would push passenger levels at National toward the air passenger limitation, necessitating further slot reductions. The Reduced Activity alternative would reduce operations without regard to passenger levels on a predetermined schedule.

Finally, all alternatives except the No Policy Change and Expanded Growth options call for a measurable rollback in the scheduling hours for air carrier and commuter aircraft to 9:30 p.m.[1] While a voluntary agreement now exists where the air carriers do not schedule turbojets after 10 p.m., it takes until 10:30 p.m. on most nights and sometimes later to complete this scheduled activity. One reason for this is that approximately 40 air carrier flights are scheduled from 9 p.m. until 9:59 p.m. and 20 flights exactly on the 10 p.m. minute. The schedule rollback would reduce this concentration of aircraft activity in the late evening hours and would actually eliminate approximately 40 existing scheduled air carrier flights. Limiting the schedule to 9:30 p.m. and limiting the number of schedules between 9 p.m. and 9:30 p.m. for air carriers should have the effect of assuring that under all but the most unusual conditions there would be no air carrier operations after 10 p.m. and before closing. In addition, the operating curfew provision for National contained in three of the policy alternatives would assure a period of calm every night.

In addition to the noise controls established within the various policy alternatives, the following currently implemented policies are expected to continue. These include:

- The prohibition of four-engine commercial jet aircraft;
- The use of reduced thrust after takeoff and reduced flaps on approach; and
- The use of preferential approach and departure paths along the Potomac River corridor[2].

One policy option with a potential for increased noise is the redefining of the 650-mile limit to 1,000 miles. The possibility here is that aircraft flying a longer distance would require more fuel and would, therefore, result in a lower takeoff profile. This potential increase, however, is tempered by three key factors.

* First, the increased distance affects only the takeoff pro-

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[1] The Expanded Growth Policy at National would roll scheduling hours back from 10:00 p.m. to 9:59 p.m., eliminating the present 10:00 p.m. "scheduling hour."

[2] Subject to possible modification because of the FAA and Council of Governments cooperative study effort.

file. Landing profiles would be the same as any other flight;

- Second, the number of additional metropolitan areas likely to be served between the 650 and 1,000 mile limits would be limited to cities such as New Orleans, Birmingham, Kansas City, and Fort Lauderdale; and

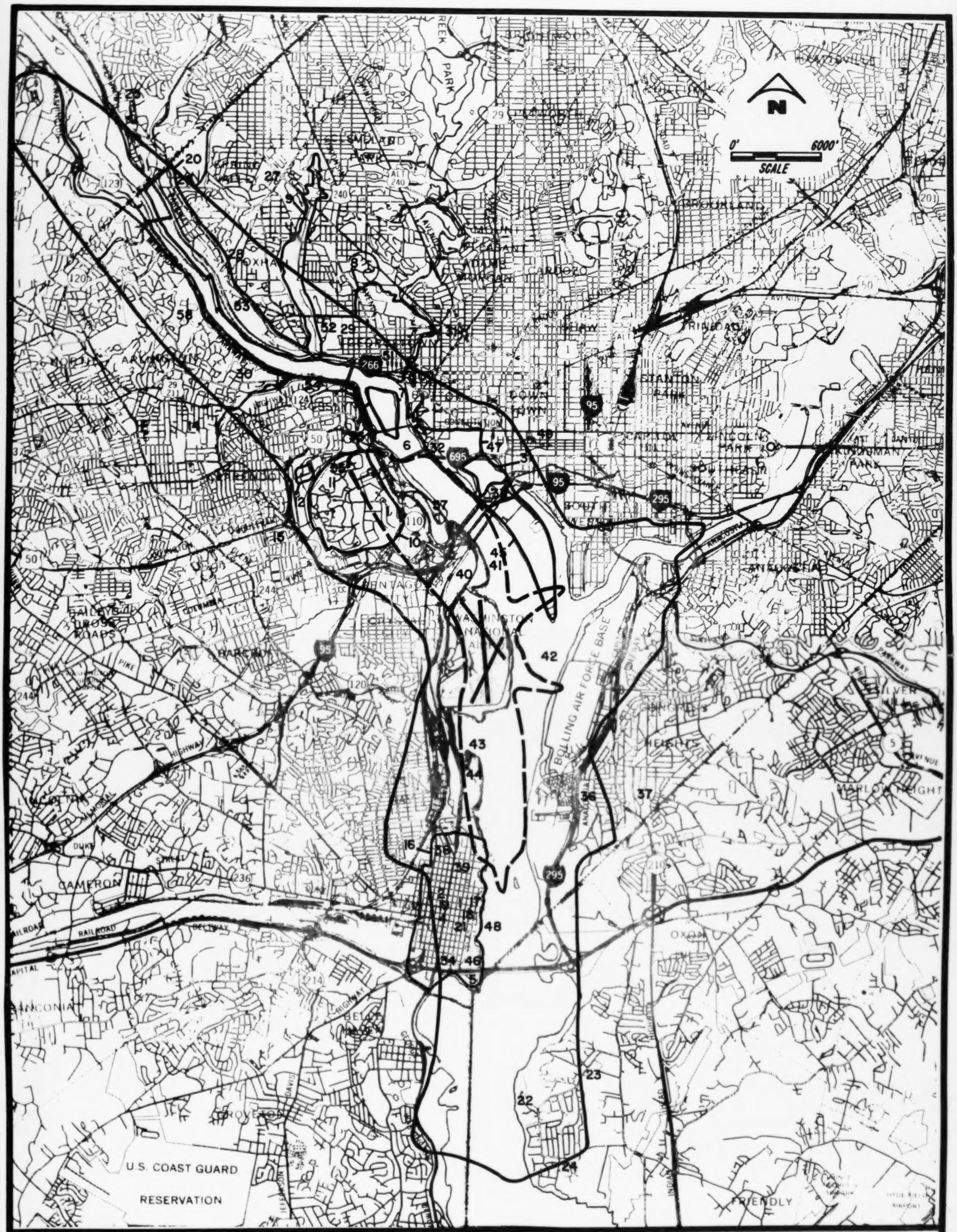
- Third, from origin and destination studies, the demand would be expected to result in about 10 new takeoffs per day to these destinations. This would amount to only 2 percent of the daily number of air carrier aircraft at National.

Table III-3 and Exhibits III-4 through III-8 indicate the range of noise impacts which are predicted to result from the various policy alternatives. In addition, Appendix Tables A-2 through A-6 and Appendix Exhibits A-2 through A-6 provide further documentation on time above (TA) noise levels at sensitive sites and noise/ land use relationships. Tables III-4 and III-5 show respectively, differences in noise exposure, at sensitive sites for each alternative and time above 65 dBA.

Comparative Summary of Noise Impacts

The analysis indicated that, at National, all policy alternatives would result in less noise exposure as compared to No Policy Change. Analyses of the remaining policy alternatives indicate that the cumulative noise impacts are greatest with the Expanded Growth case and least with the Reduced Activity alternative. This is illustrated in the bar charts provided on Exhibit III-9. The two charts present a comparison of area and population within the NEF 30 contour for the present condition and the policy alternatives. As can be seen, the alternatives vary significantly in their noise impacts. Areas within the NEF 30 contour range from 35 square miles under the No Policy Change case to 6 square miles with the Reduced Activity alternative. In addition, since the centerlines of aircraft flight tracks generally follow the Potomac River, the population affected is primarily located near the outer edges of the contours. Thus, as the contour reduces in size, populated areas affected reduce rapidly. It is estimated that approximately 75,000 people currently live within the NEF 30 contour. This level would increase to 116,000 under the No Policy Change alternative and to 82,000 under the Expanded Growth alternative. The population within the NEF 30 contour would decrease to 24,000, 21,000, and 1,200 respectively by 1990 under the 18 Million, 16 Million, and Reduced Activity alternatives. By comparing the exposure information at the representative sensitive sites in Appendix Tables A-2 through A-6and Table II-5, it can be seen that the length of time above various threshold levels would also change under the various policy alternatives in a similar manner.

Finally, it should again be emphasized that these population levels do not represent all of the people impacted by aircraft noise in the Washington area. See the previous discussion in the existing conditions portion of this Noise section. Essentially, people living within the 30 NEF contour have a significantly higher probability of being impacted by aircraft noise and overflights as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ANACOSTIA
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LEGEND

HISTORIC SITES

1. GADSBY'S TAVERN
2. LLOYD HOUSE
3. TIDAL BASIN
4. THE LYCEUM
5. JONES POINT LIGHTHOUSE
6. ARLINGTON MEMORIAL BRIDGE
7. THEODORE ROOSEVELT ISLAND
8. GEORGETOWN HISTORIC DISTRICT
9. GLOVER ARCHIBALD PARKWAY
10. ARLINGTON NATIONAL CEMETERY
11. ARLINGTON HOUSE and ROBERT E. LEE MEMORIAL
12. FT. MYER HISTORIC DISTRICT
13. DOUBLEDAY MANSION
14. THE GLEBE
15. C. R. DREW HOUSE
16. ALEXANDRIA HISTORIC DISTRICT
17. BANK OF ALEXANDRIA
18. CARLYLE HOUSE
19. CHRIST CHURCH
20. POTOMAC GORGE and C & O CANAL

REPRESENTATIVE SENSITIVE SITES

21. ST. MARY'S CHURCH
22. FORT FOOTE PARK
23. FT. FOOTE BAPTIST CHURCH
24. INDIAN QUEEN SCHOOL
25. BROOKMONT SCHOOL
26. SIBLEY HOSPITAL
27. AMERICAN UNIVERSITY
28. ST. JOHN'S CHILD DEVELOPMENT CENTER
29. GEORGETOWN UNIVERSITY
30. WOODMONT SCHOOL
31. COLUMBIA HOSPITAL
32. LINCOLN MEMORIAL
33. JEFFERSON MEMORIAL
34. ST. MARY'S SCHOOL
35. SYPHAX SCHOOL
36. HADLEY HOSPITAL
37. ST. THOMAS MORE SCHOOL
38. GRAY HIGH SCHOOL
39. ST. JOSEPH'S SCHOOL

PARKS AND RECREATION AREAS

40. WATERFOWL SANCTUARY
41. GRAVELLY POINT PARK
42. POTOMAC RIVER
43. MARINA
44. DAINGERFIELD ISLAND
45. EAST POTOMAC PARK
46. JONES POINT PARK
47. WEST POTOMAC PARK
48. POTOMAC VIEW PARK
49. THE MALL
50. ROCK CREEK AND POTOMAC PARKWAY
51. C & O CANAL
52. ARCHIBOLD PARKWAY
53. POTOMAC PALISADES PARKWAY
54. GEORGE WASHINGTON MEMORIAL PARKWAY
55. ARLINGTON HOUSE
56. IWO JIMA MEMORIAL
57. LADY BIRD JOHNSON PARK
58. NORTHERN VIRGINIA REGIONAL PARK

LEGEND

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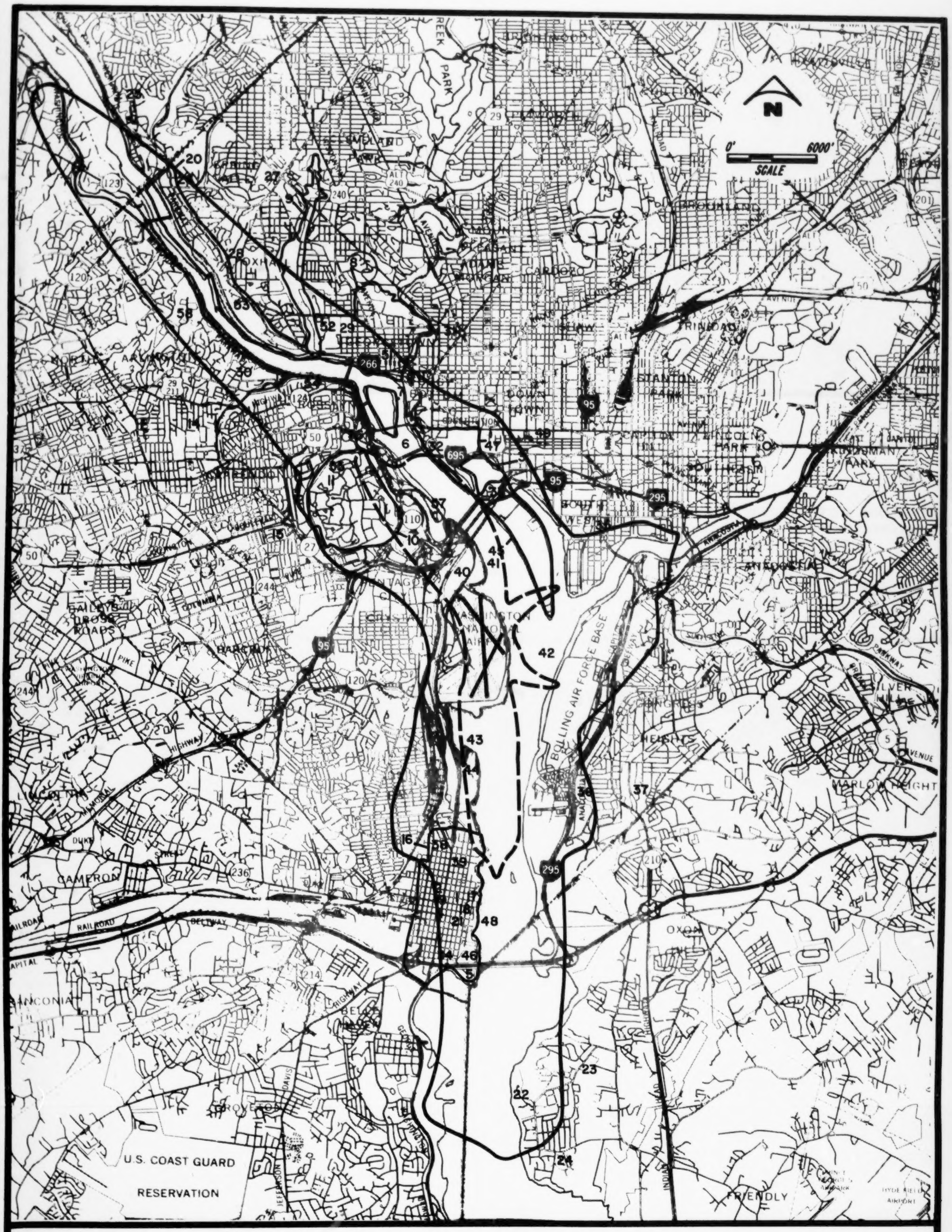
▬ ▬ NEF 40

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

NATIONAL AIRPORT
1990 NEF CONTOURS
NO POLICY CHANGE

EXHIBIT III-4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LINCOLN PARK
DOWNTOWN
TRINIDAD
CONGRESS HEIGHTS
MARLOW HEIGHTS
SILVER HILL
OXON HILL
BAILEYS CROSS ROADS
CAMERON
U.S. COAST GUARD
RESERVATION
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HYDE FIELD AIRPORT
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HISTORIC SITES

1. GADSBY'S TAVERN
2. LLOYD HOUSE
3. TIDAL BASIN
4. THE LYCEUM
5. JONES POINT LIGHTHOUSE
6. ARLINGTON MEMORIAL BRIDGE
7. THEODORE ROOSEVELT ISLAND
8. GEORGETOWN HISTORIC DISTRICT
9. GLOVER ARCHIBALD PARKWAY
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13. DOUBLEDAY MANSION
14. THE GLEBE
15. C. R. DREW HOUSE
16. ALEXANDRIA HISTORIC DISTRICT
17. BANK OF ALEXANDRIA
18. CARLYLE HOUSE
19. CHRIST CHURCH
20. POTOMAC GORGE and C & O CANAL

REPRESENTATIVE SENSITIVE SITES

21. ST. MARY'S CHURCH
22. FORT FOOTE PARK
23. FT. FOOTE BAPTIST CHURCH
24. INDIAN QUEEN SCHOOL
25. BROOKMONT SCHOOL
26. SIBLEY HOSPITAL
27. AMERICAN UNIVERSITY
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53. POTOMAC PALISADES PARKWAY
54. GEORGE WASHINGTON MEMORIAL PARKWAY
55. ARLINGTON HOUSE
56. IWO JIMA MEMORIAL
57. LADY BIRD JOHNSON PARK
58. NORTHERN VIRGINIA REGIONAL PARK

LEGEND

—— NEF 30

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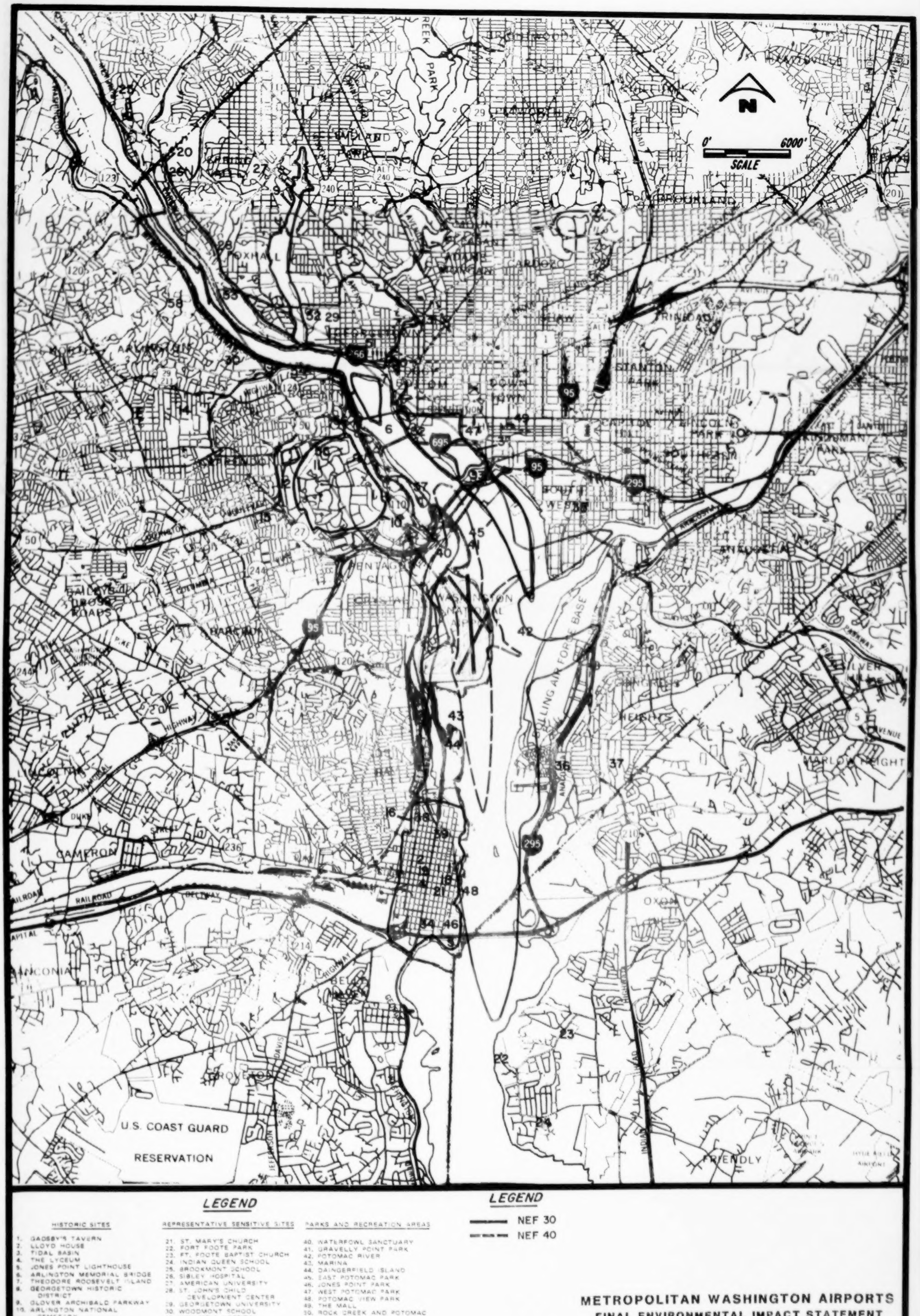
METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

NATIONAL AIRPORT 1990 NEF CONTOURS EXPANDED GROWTH AT NATIONAL

EXHIBIT III-5



LEGEND

HISTORIC SITES

1. GADSBY'S TAVERN
2. LLOYD HOUSE
3. TIDAL BASIN
4. THE LYCEUM
5. JONES POINT LIGHTHOUSE
6. ARLINGTON MEMORIAL BRIDGE
7. THEODORE ROOSEVELT ISLAND
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11. ARLINGTON HOUSE and ROBERT E. LEE MEMORIAL
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13. DOUBLEDAY MANSION
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15. C. R. DREW HOUSE
16. ALEXANDRIA HISTORIC DISTRICT
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18. CARLYLE HOUSE
19. CHRIST CHURCH
20. POTOMAC GORGE and C & O CANAL

REPRESENTATIVE SENSITIVE SITES

21. ST. MARY'S CHURCH
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31. COLUMBIA HOSPITAL
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38. GRAY HIGH SCHOOL
39. ST. JOSEPH'S SCHOOL

PARKS AND RECREATION AREAS

40. WATERFOWL SANCTUARY
41. GRAVELLY POINT PARK
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43. MARINA
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53. POTOMAC PALISADES PARKWAY
54. GEORGE WASHINGTON MEMORIAL PARKWAY
55. ARLINGTON HOUSE
56. IWO JIMA MEMORIAL
57. LADY BIRD JOHNSON PARK
58. NORTHERN VIRGINIA REGIONAL PARK

LEGEND

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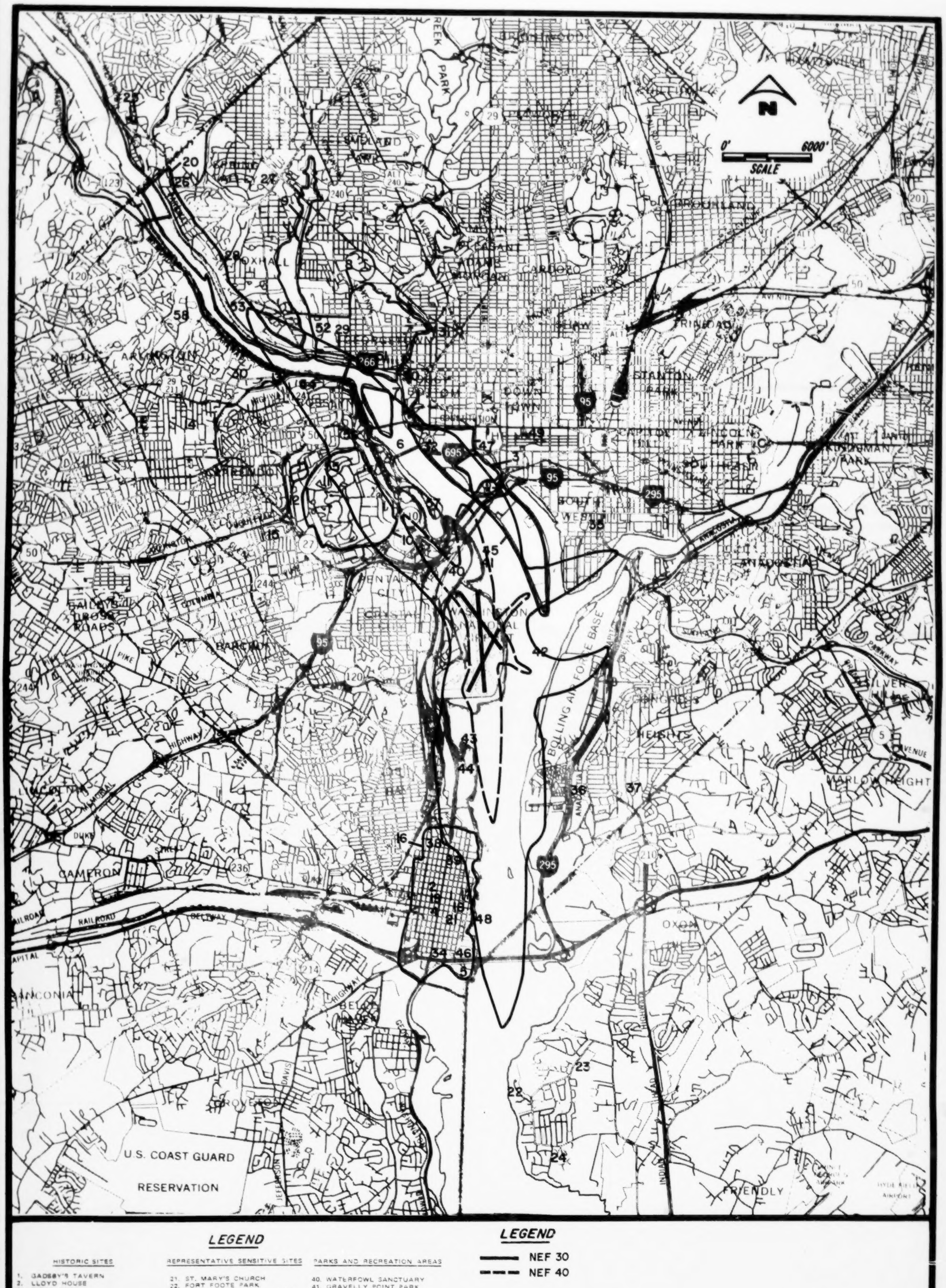
METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

NATIONAL AIRPORT
1990 NEF CONTOURS
CONTROLLED GROWTH TO 18 MILLION PASSENGERS AT NATIONAL

EXHIBIT III-6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STANTON PARK
LINCOLN PARK
CAPITOL HILL
SOUTHWEST
ROCK CREEK PARK
BAILEYS CROSS ROADS
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LEGEND

HISTORIC SITES

1. GADSBY'S TAVERN
2. LLOYD HOUSE
3. TIDAL BASIN
4. THE LYCEUM
5. JONES POINT LIGHTHOUSE
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17. BANK OF ALEXANDRIA
18. CARLYLE HOUSE
19. CHRIST CHURCH
20. POTOMAC GORGE and C & O CANAL

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29. GEORGETOWN UNIVERSITY
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38. GRAY HIGH SCHOOL
39. ST. JOSEPH'S SCHOOL

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43. MARINA
44. DAINGERFIELD ISLAND
45. EAST POTOMAC PARK
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52. ARCHIBOLD PARKWAY
53. POTOMAC PALISADES PARKWAY
54. GEORGE WASHINGTON MEMORIAL PARKWAY
55. ARLINGTON HOUSE
56. IWO JIMA MEMORIAL
57. LADY BIRD JOHNSON PARK
58. NORTHERN VIRGINIA REGIONAL PARK

LEGEND

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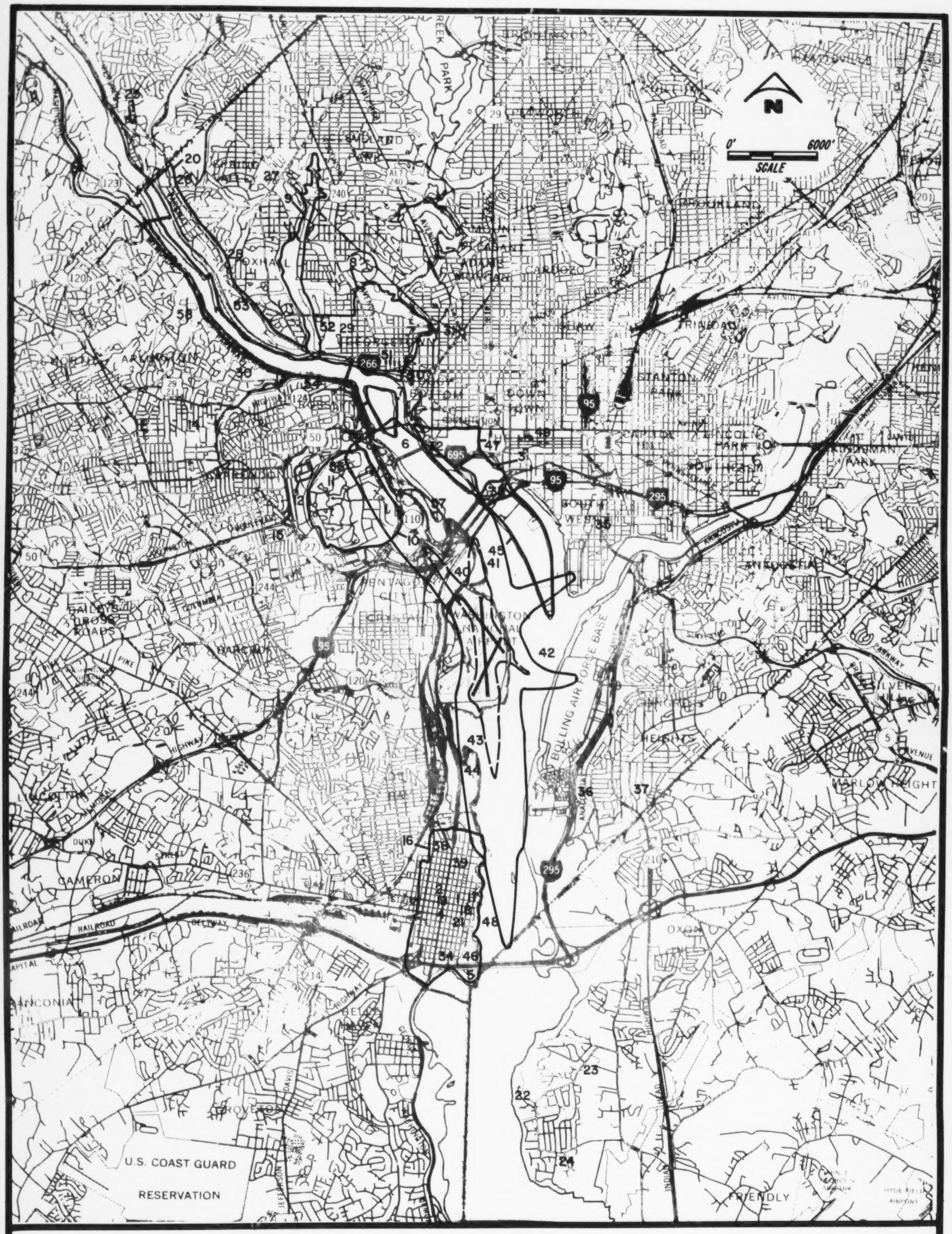
METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

NATIONAL AIRPORT
1990 NEF CONTOURS
CONTROLLED GROWTH TO 16 MILLION PASSENGERS AT NATIONAL

EXHIBIT III-7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PENTAGON CITY
CRYSTAL CITY
FOXHALL
NORTH ARLINGTON
BAILEYS CROSS ROADS
FRANCONIA
GROVETON
BELLE HAVEN
TRINIDAD
STANTON PARK
LINCOLN PARK
KINGMAN PARK
MARLOW HEIGHTS
SILVER HILL
HILLCREST HEIGHTS
BROOKLAND
MOUNT PLEASANT
ADAMS MORGAN
CARDOZO
REPUBLICAN PARK
ROCK CREEK PARK
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LEGEND

HISTORIC SITES

1. GADSBY'S TAVERN
2. LLOYD HOUSE
3. TIDAL BASIN
4. THE LYCEUM
5. JONES POINT LIGHTHOUSE
6. ARLINGTON MEMORIAL BRIDGE
7. THEODORE ROOSEVELT ISLAND
8. GEORGETOWN HISTORIC DISTRICT
9. GLOVER ARCHIBALD PARKWAY
10. ARLINGTON NATIONAL CEMETERY
11. ARLINGTON HOUSE and ROBERT E. LEE MEMORIAL
12. FT. MYER HISTORIC DISTRICT
13. DOUBLEDAY MANSION
14. THE GLEBE
15. C. R. DREW HOUSE
16. ALEXANDRIA HISTORIC DISTRICT
17. BANK OF ALEXANDRIA
18. CARLYLE HOUSE
19. CHRIST CHURCH
20. POTOMAC GORGE and C & O CANAL

REPRESENTATIVE SENSITIVE SITES

21. ST. MARY'S CHURCH
22. FORT FOOTE PARK
23. FT. FOOTE BAPTIST CHURCH
24. INDIAN QUEEN SCHOOL
25. BROOKMONT SCHOOL
26. SIBLEY HOSPITAL
27. AMERICAN UNIVERSITY
28. ST. JOHN'S CHILD DEVELOPMENT CENTER
29. GEORGETOWN UNIVERSITY
30. WOODMONT SCHOOL
31. COLUMBIA HOSPITAL
32. LINCOLN MEMORIAL
33. JEFFERSON MEMORIAL
34. ST. MARY'S SCHOOL
35. SYPHAX SCHOOL
36. HADLEY HOSPITAL
37. ST. THOMAS MORE SCHOOL
38. GRAY HIGH SCHOOL
39. ST. JOSEPH'S SCHOOL

PARKS AND RECREATION AREAS

40. WATERFOWL SANCTUARY
41. GRAVELLY POINT PARK
42. POTOMAC RIVER
43. MARINA
44. DAINGERFIELD ISLAND
45. EAST POTOMAC PARK
46. JONES POINT PARK
47. WEST POTOMAC PARK
48. POTOMAC VIEW PARK
49. THE MALL
50. ROCK CREEK AND POTOMAC PARKWAY
51. C & O CANAL
52. ARCHIBOLD PARKWAY
53. POTOMAC PALISADES PARKWAY
54. GEORGE WASHINGTON MEMORIAL PARKWAY
55. ARLINGTON HOUSE
56. IWO JIMA MEMORIAL
57. LADY BIRD JOHNSON PARK
58. NORTHERN VIRGINIA REGIONAL PARK

LEGEND

———	NEF 30
– – –	NEF 40

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

NATIONAL AIRPORT
1990 NEF CONTOURS
REDUCED ACTIVITY AT NATIONAL

EXHIBIT III-8

TABLE III-4

WASHINGTON NATIONAL AIRPORT DIFFERENCES IN CUMULATIVE NOISE EXPOSURE AT IDENTIFIED REPRESENTATIVE SITES FROM TABLE III-3 UNDER THE POLICY ALTERNATIVES FOR VARIOUS NEF LEVELS[a]

Number of Sites Within NEF Range[b]

NEF Range	Existing Conditions	No Policy Change	Expanded Growth Policy at National	Controlled Passenger Growth at National		Reduced Activity Policy at National
				18 Million	16 Million	
Less than 20	-	-	-	-	1	7
20 - 29	11	7	8	32	35	39
30 - 40	41	46	45	26	22	13
Greater than 40	7	6	6	1	1	0

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[a] See Table III-1 for land use criteria.

[b] 59 sites.

TABLE III-5

WASHINGTON NATIONAL AIRPORT CHANGES IN TOTAL MINUTES ABOVE 65 dBA AT IDENTIFIED REPRESENTATIVE SITES[a] AS COMPARED TO EXISTING CONDITIONS

Policy Alternative				
No Policy Change	Expanded Growth Policy at National	Controlled Growth Policy to 18 Million Passengers at National	Controlled Growth Policy to 16 Million Passengers at National	Reduced Activity Policy at National
15.0% Increase	5.7% Reduction	22.2% Reduction	31.7% Reduction	54.6% Reduction

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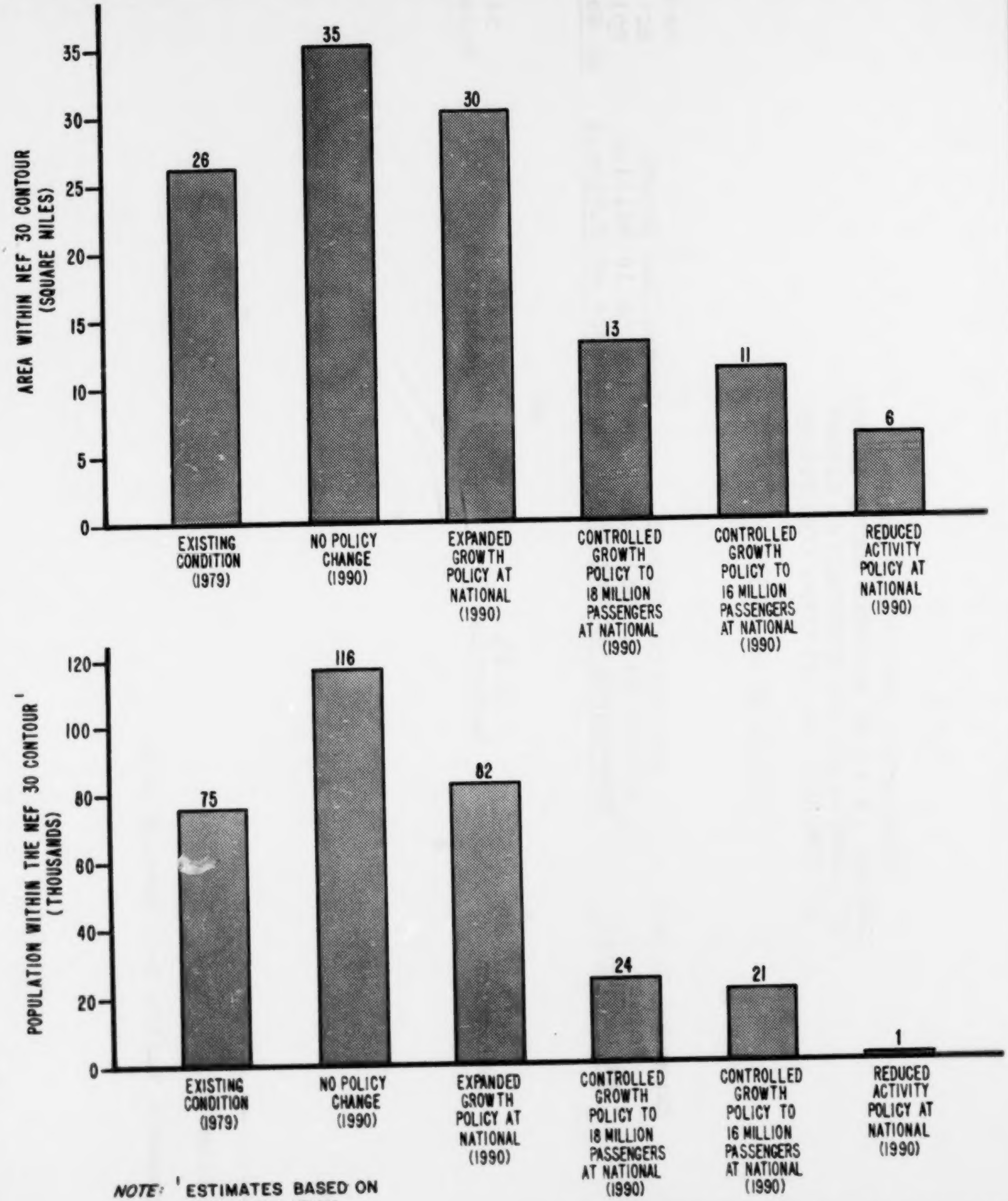
[a] 59 sites.

SOURCE: Appendix Tables A-1 through A-6.



NOTE: [1] ESTIMATES BASED ON 1980 POPULATION.

METROPOLITAN WASHINGTON AIRPORTS

FINAL ENVIRONMENTAL IMPACT STATEMENT

ALTERNATIVE NOISE IMPACT COMPARISONS AT NATIONAL

EXHIBIT III-9

compared to people located outside of this contour. In any case, people outside the 30 NEF contour would experience the same relative change in noise impact as shown by the various policy alternatives.

Thus, when compared to the 1990 No Policy Change and Expanded Growth options a measurable improvement in the noise conditions around National can be expected under the remaining policy alternatives. This results from a combination of factors including retrofitting of aircraft to meet FAR Part 36 standards, introduction of the quieter new generation of aircraft and, for some alternatives, passenger limitations and the related reduction in slots, the rollback in slots under the Reduced Activity alternative, and the rollback of scheduling hours for air carrier and commuter aircraft. Table III-5 summarizes changes in total minutes above 65 dBA at representative sensitive sites under the policy alternatives as compared to existing conditions.

Surface Transportation Noise

Under all alternatives, with the exception of the Reduced Activity alternative, some vehicular traffic increases can be expected. The overall airport-related average daily traffic is expected to increase between 6 and 37 percent. Since a doubling of the source (a 100 percent increase in traffic) would theoretically increase levels by 3 dBA, it can be expected that there would be a 1 dBA or less increase in traffic noise as a result of any of the policy alternatives. The Reduced Activity Alternative would be expected to reduce surface traffic noise levels less than 1 dBA from present conditions.

In addition, if the level of service of the highways drops below C[1] (typically the noisiest traffic condition) as a result of increased traffic, the lower speeds could result in lower noise levels. In any event, the additional traffic noise impact from any of the policy alternatives would not be noticeable.

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[1] Level of Service C is defined as a traffic condition where speed and maneuverability are closely controlled by high volumes and where drivers are restricted in their freedom to select speed, change lanes or pass.

SURFACE ACCESS

Introduction and Methodology

This section summarizes the surface transportation access analyses for the 1979 existing condition case and future (1990) projected conditions assuming implementation of a future alternative operating policy at National. The analyses performed included examination of average week, peak weekday, and hourly vehicle flows of arriving and departing airport-related traffic, as well as general non-airport through traffic flows. Applicable modes of surface transportation were included in these analyses.

Existing general traffic data for the roadways adjacent to the airport was obtained from Metropolitan Washington Council of Governments (COG), City of Alexandria (Virginia), the Virginia Department of Highways and Transportation (VDHT), and the National Park Service (U.S. Department of the Interior). Future traffic data for adjacent roadways was obtained from the Transportation Engineering Division of COG and the Transportation Planning Department of VDHT. Traffic data factors (i.e., mode-split, vehicle occupancy, vehicle trip rates) for airport-related and through traffic were obtained from COG, VDHT, and FAA study projects and reports.[1]

Volumes of airport-related vehicular traffic were determined by applying modal split and vehicle trip generation rates to the existing and projected level of passenger originations and terminations at National. These existing and future vehicle trip generation factors were obtained from previous planning documents prepared for the FAA[1]. Air passenger originations and terminations were assumed to exclude transfer passengers at the airport. The methodology utilized in estimating airport-related traffic volumes provided for calculation of average week traffic, peak weekday traffic, and hourly variations of these average week and peak weekday traffic flows.

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[1] Howard, Needles, Tammen and Bergendoff, Washington National Airport Interim Access Improvement Program, 1973.

-Howard, Needles, Tammen and Bergendoff, Washington National Airport/Road Study, 1977. Various working papers.

-Metropolitan Washington Council of Governments, National Capital Region Transportation Planning Board, Washington National Airport Rail Rapid Transit - Metrorail Access Study, 1979.

-Virginia Department of Highways and Transportation, JHK and Associates, Jefferson Davis Corridor Study (Draft), 1980.

-Metropolitan Washington Council of Governments, National Capital Region Transportation Planning Board, Testing of Transportation Plan Alternatives, 1976.

-Metropolitan Washington Council of Governments, The Future of Washington's Airports (Summary Report), 1975.

-Metropolitan Washington Council of Governments, National Capital Region Transportation Planning Board, Metro Core Cordon Count of Vehicular and Passenger Volumes (Summary), 1976.

Based upon the data and reports received from the various agencies, previously noted, the following assumptions were made for calculating vehicle trips associated with Washington National Airport:

1979 Existing Condition Analysis

* Average week originating and terminating (O and T) passengers = 216,500
* Peak day volume of average week O and T passengers = 16 percent
* Non-employee (airport related) transit mode split = 15 percent[2]
* Airport employee transit mode split = 8 percent[3]
* Airport-related vehicle trip rate - 1.83 trips per O & T passenger
* Vehicle occupancy rate - 1.40 people per vehicle

1990 Policy Alternatives Analysis

* Average week originating and terminating (O and T) passengers range from 222,300 to 327,900
* Peak day volume of average week O and T passengers = 16 percent
* Airport Non-employee transit mode split = 20 percent[4]

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[1] Howard, Needles, Tammen and Bergendoff, Washington National Airport Interim Access Improvement Program, 1973.

-Howard, Needles, Tammen and Bergendoff, Washington National Airport/Road Study, 1977. Various working papers.

-Metropolitan Washington Council of Governments, National Capital Region Transportation Planning Board, Washington National Airport Rail Rapid Transit - Metrorail Access Study, 1979.

-Federal Aviation Administration, Office of Aviation Policy, Profiles of Schedules Air Carrier Passenger Traffic for Top 100 U.S. Airports, 1979.

[2] Metropolitan Washington Council of Governments, National Capital Region Transportation Planning Board, Washington National Airport Rail Rapid Transit - Metrorail Access Study, 1979.

[3] Howard, Needles, Tammen and Bergendoff, Washington National Airport/Road Study, 1977. Various working papers.

[4] Assumed increased in Metro use from 1979 level of 15 percent to 20 percent in 1990 due to future enhanced Metro accessibility, improvements to Airport-Metro interface and continuing energy constraints with resultant travel-cost penalties.

- Airport employee transit mode split = 25 percent[1]
- Airport-related vehicle trip rate - 1.83 trips per O & T passenger
- Vehicle occupancy rate - 1.6 passengers per vehicle

The peak hour of passenger activity for National is 6 - 7 PM and currently represents approximately 7.7 percent of the total daily enplanements and deplanements. The heaviest PM peak movements of through, or non-airport traffic is generally from 4 - 6 PM. To provide a conservative, or "worst case" analysis, the access roadway analyses utilize PM peak traffic loadings for both through and airport-vehicle flows. The airport percentage of peak day traffic is assumed to be approximately 8 percent. The external roadway PM peak hour percentages on U.S. 1 and George Washington Parkway currently range from less than 7 percent (U.S. 1) to over 8 percent (G.W. Parkway, south of airport). Future year external roadway PM peak hour percentages were assumed to range from 7 to 7.5 percent.

Since employee vehicle work-trips associated with the airport has peaking characteristics dissimilar to those usually associated with the pattern of air passenger originations and terminations, they were calculated separately, utilizing shift schedules for National. These work trips were then added to the appropriate hourly airport vehicle flows determined for the internal and external roadway links.

These daily and hourly vehicle volumes of all airport-related trips (excluding all non-auto modes) were assigned to external roadway links near the airport, along with through traffic.

The area of immediate surface transportation impact for National is delineated by Interstate 395 and the 14th Street Bridges on the north, the Arlington County line on the south, and U.S. Route 1 on the west. The principal roadways affected include Route 1 (Jefferson Davis Highway), George Washington Memorial Parkway, and the Virginia Route 233 Viaduct. This surface transportation impact area was divided into access roadway (AR) links to allow detailed investigation of specific travel corridor movements.

Generalized hourly volume-to-capacity ratio comparison were conducted for specific external access roadway links. These access highway facility level of traffic service evaluations are based upon the criteria for Level of Service (LOS) C contained in the Highway Capacity Manual (1965 Edition) and the Transportation and Traffic Engineering Handbook (1976 Edition).

A brief description of the levels of service for a typical facility are:

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[1] Howard, Needles, Tammen and Bergendoff, Washington National Airport/Road Study, 1977. Various working papers.

* LOS A - Free flow of traffic, no restrictions on operating speed.

* LOS B - Stable flow, few restrictions on operating speed.

* LOS C - Stable flow, higher volume, more restrictions on speed and lane changing.

* LOS D - Approaching unstable flow, little freedom to maneuver, condition tolerable for short periods.

* LOS E - Unstable flow, lower operating speeds, some momentary stoppages.

* LOS F - Forced flow at low speeds, highway acts as storage area, many stoppages.

Existing Conditions

Principal surface access from the Washington, D.C. central core area is provided via the 14th Street Bridge and the George Washington Memorial Parkway south to the Abingdon Drive and Virginia Route 233 airport access points. The George Washington Memorial Parkway is a controlled access divided highway with two lanes in each direction south of the airport and three lanes in each direction north to the 14th Street Bridge. Direct access is provided to National, but not to nearby Crystal City. Crystal City development lies between U.S. Route 1 and National and is a significant generator of vehicular traffic. Exhibit III-10 provides existing airport and non-airport vehicle volumes on roadways around National. The latest traffic counts on the George Washington Memorial Parkway north of the airport indicate approximately 74,000 vehicles per day (two-way) utilizing the facility with the peak hour averaging nearly 7.5 percent of the daily volume. Planning data indicates this airport access route (Parkway north) is utilized by approximately 56.5 percent of all airport-related trips, or approximately 33,700 average daily trips and 2,700 P.M. peak hour two-way trips.[1]

The secondary access route for airport-related vehicles is via U.S. Route 1 (Jefferson Davis Highway). U.S. Route 1 is major arterial highway connecting Washington, D.C. and the City of Alexandria via the 14th Street Bridge. The existing U.S. Route 1 is a four-lane, undivided highway with uncontrolled access and with all intersections at-grade. Access to National from U.S. Route 1

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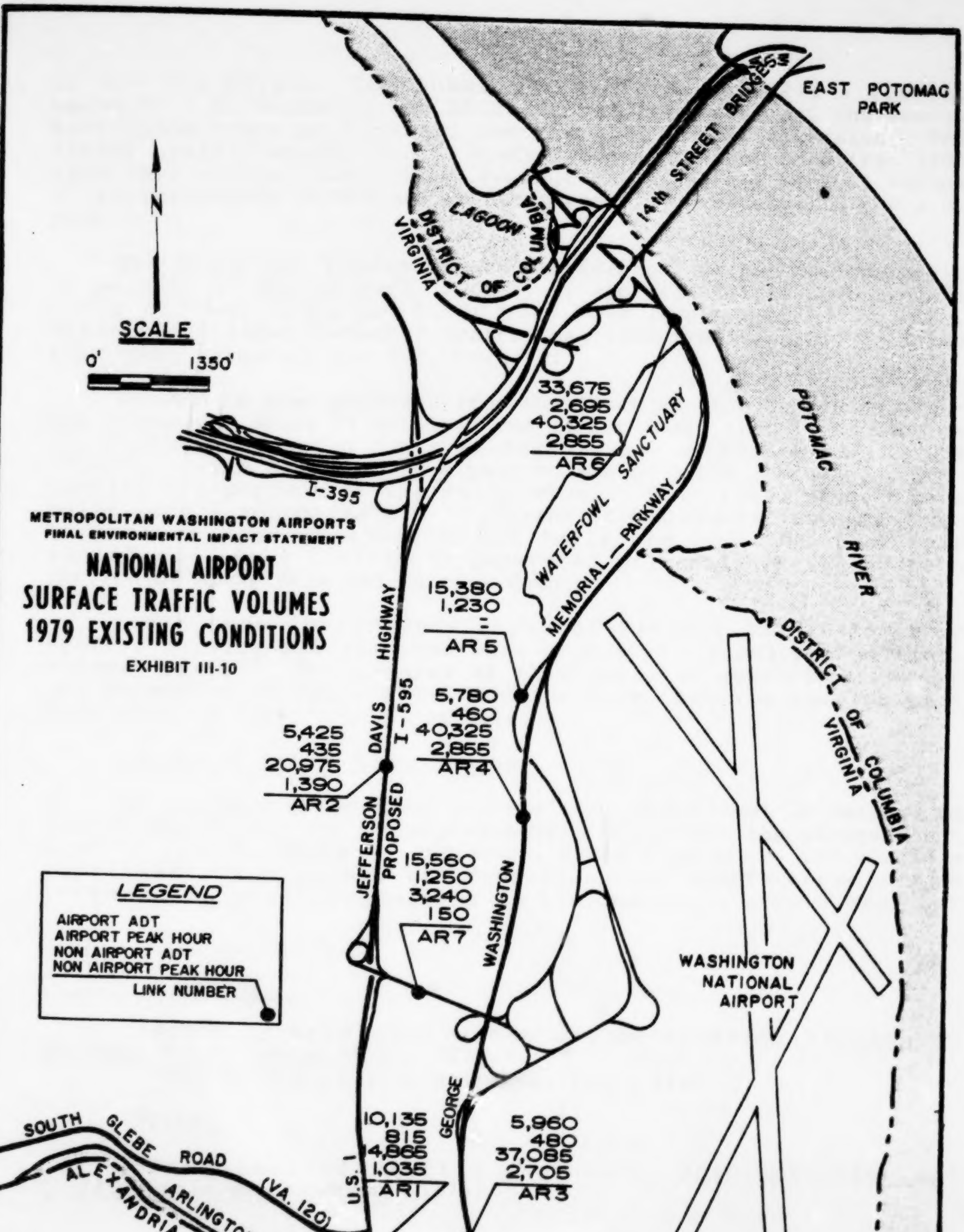
[1] Howard, Needles, Tammen and Bergendoff, Washington National Airport/Road Study, 1977.
—Greiner Engineering Sciences, Inc., 1980.



METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

**NATIONAL AIRPORT
SURFACE TRAFFIC VOLUMES
1979 EXISTING CONDITIONS**

EXHIBIT III-10

N
SCALE
0'
1350'
LEGEND
AIRPORT ADT
AIRPORT PEAK HOUR
NON AIRPORT ADT
NON AIRPORT PEAK HOUR
LINK NUMBER
EAST POTOMAC PARK
14th STREET BRIDGES
LAGOON
DISTRICT OF COLUMBIA
VIRGINIA
I-395
POTOMAC RIVER
WATERFOWL SANCTUARY
MEMORIAL PARKWAY
33,675
2,695
40,325
2,855
AR 6
15,380
1,230
-
AR 5
5,780
460
40,325
2,855
AR 4
5,425
435
20,975
1,390
AR 2
15,560
1,250
3,240
150
AR 7
JEFFERSON DAVIS HIGHWAY
PROPOSED I-595
GEORGE WASHINGTON
WASHINGTON NATIONAL AIRPORT
DISTRICT OF COLUMBIA
VIRGINIA
10,135
815
14,865
1,035
AR 1
5,960
480
37,085
2,705
AR 3
U.S. 1
SOUTH GLEBE ROAD
(VA. 120)
ALEXANDRIA CITY
ARLINGTON CO.

is via the Airport Connector (Virginia Route 233), a viaduct spanning U.S. Route 1, the RF and P railroad yard and the George Washington Memorial Parkway, and the 15th Street extension. The latest traffic counts on U.S. Route 1 south of Glebe Road (Va. 120) show this highway carried an average daily two-way vehicle volume of approximately 25,000 and an estimated 1,850 vehicles in the P.M. peak hour.

The Route 233 Viaduct route provides access for approximately 26 percent of the airport traffic, or approximately 15,600 average daily two-way trips and 1,300 peak hour two-way trips in 1979. Non-airport local commuter traffic has also traditionally utilized this route to access the G.W. Parkway.[1]

Access is also provided from the south via the George Washington Parkway. South of National the latest daily traffic volumes on the George Washington Memorial Parkway are approximately 43,000 (two-way) with the P.M. peak hour volume of 3,200 (two-way) representing 7.4 percent of the daily flow. This third major access point serves approximately 10 percent of the traffic utilizing the airport or approximately 6,000 daily and 480 P.M. peak hour vehicles.[2] This traffic is generated primarily in the eastern portion of Alexandria and Fairfax County.

Based upon the volumes shown on Exhibit III-10 level of traffic service calculations were conducted for selected external roadway links.[3] The results of this level of service assessment are presented in Table III-6 and indicate that the general peak hour level of service is acceptable.

Impacts of Policy Alternatives

The roadway network in the vicinity of National is assumed to remain essentially as it is presently. Except for the proposed upgrading of U.S. Route 1 (Jefferson Davis Highway) by the Virginia Department of Highways and Transportation (VDHT) there are no large-scale roadway projects in the immediate area. The VDHT

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[1] Howard, Needles, Tammen and Bergendoff, Washington National Airport/Road Study, 1977.
-Greiner Engineering Sciences, Inc., 1980.

[2] Ibid.

[3] Institute of Traffic Engineers, Transportation and Traffic Engineers Handbook, 1976.

TABLE III-6

ACCESS ROADWAY LEVELS OF SERVICE
WASHINGTON NATIONAL AIRPORT

1979 EXISTING CONDITIONS

ACCESS ROADWAY LINK	PEAK ONE-WAY VOLUME	VOLUME/ CAPACITY RATIO	LEVEL OF SERVICE
AR1	1,200	0.80	C
AR2	1,130	0.75	C
AR3	2,230	0.56	C
AR4	2,320	0.58	C
AR5	1,230	0.62	C
AR6	3,330	0.56	B
AR7	980	0.65	B

Alternative D-1 plan for existing U.S. Route 1 provides for an upgraded, six-lane divided urban arterial facility from south of Glebe Road (VA 120) north to Interstate 395. Proposed improvements under the D-1 alternative would include upgraded intersection designs and improved signalization with more efficient traffic flow in the Jefferson Davis corridor. It is assumed for the purposes of this assessment that the D-1 alternative is selected as the final plan for the Route 1 corridor and is operational by 1990.

The most significant additional element to influence airport-related vehicle volumes in the future will be the activity level of the new Metro Rail link recently completed at National. The latest surveys and planning reports for the airport indicate that approximately 15 percent of all airport-related trips and 5 percent of all employee work-trips are Metro Rail trips.[1] Bus transit usage is estimated to range from 3 to 8 percent for employee work trips.[2] Future transit usage is expected to provide for 20 percent Metro and 5 percent bus mode split for employees,[3] and a 20 percent Metro use by non-employee airport trips.[4]

Current directions of approach and departure for airport-related trips were assumed to remain constant for the assessment period.

All policy alternatives, except the Reduced Activity option, would increase daily and peak hour National Airport related traffic volumes on the pertinent external roadways above those presently experienced. Provided in the text and associated exhibits and tables is an evaluation of the possible impacts resulting from each policy.

No Policy Change

The No Policy Change alternative is expected to increase daily airport-related vehicle flows by approximately 23.5 percent or 14,000 vehicle trips (two-way) above those currently experienced.

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[1] Metropolitan Washington Council of Governments, National Capital Region Transportation Planning Board, Washington National Airport Rail Rapid Transit-Metrorail Access Study, 1979.

[2] Howard, Needles, Tammen and Bergendoff, Washington National Airport/Road Study, 1977.

[3] Ibid.

[4] Assumed increase in Metro use from 1979 level of 15 percent to 20 percent in 1990 due to future enhanced Metro accessibility, improvements to the airport-Metro interface, and continuing energy constraints with resultant travel-cost penalties.

Exhibit III-11 shows the projected airport and non-airport traffic volumes for the year 1990 under the No Policy Change alternative. Table III-7 provides a generalized review of calculated future levels of service[1] for selected external roadway links based upon the volumes shown on Exhibit III-11. The results of the LOS assessment indicates that three links (AR5, AR6 and AR7) could experience a reduction in the level of service over the 1979 conditions; while two links (AR1 and AR2) show improved levels. Only the southbound off-ramp to Washington National from George Washington Parkway (AR5) is below level of service "C." The VA Route 233 (AR7) and the G.W. Parkway North (AR6) both drop from LOS "B" to LOS "C" under this alternative, however, LOS "C" is an acceptable level of service.

The improvements to the levels of service on the Route 1 segments (AR1 and AR2) are reflective of the corridor's planned upgrading by the Virginia Department of Highways and Transportation.

Expanded Growth Policy at National

The Expanded Growth Policy alternative, which allows for up to approximately 21,750,000 total passengers at National in the year 1990, is expected to increase daily airport-related vehicle flows by approximately 37 percent or 22,200 vehicle trips (two-way) above those currently experienced in 1979.

Exhibit III-12 shows the projected airport and non-airport traffic volumes for the year 1990 under the Expanded Growth alternative plan. Table III-7 provides a generalized review of calculated future levels of service for selected external roadway links based upon the volumes shown on Exhibit III-12. The results of the LOS assessment, shown in Table III-7, indicate that three links (AR5, AR6 and AR7) could experience a reduction in the level of service over the 1979 conditions (see Table III-6); while two links (AR1 and AR2) show improved levels.

Only the southbound off-ramp to Washington National from George Washington Parkway (AR5) and the VA Route 233 viaduct (AR7) are below LOS "C." Level of service "E" (unstable flow, some momentary stoppages), indicated on AR5, is an unacceptable level of service. The LOS "D" condition (approaching unstable flow) for AR7 is a commonly accepted level for inner urban core areas during peaking conditions. The drop in level of service for AR6 from LOS "B" to LOS "C" is an acceptable operating condition.

The improvements to the levels of service on the Route 1 segments (AR1 and AR2) are reflective of the corridor's planned upgrading by the Virginia Department of Highways and Transportation.

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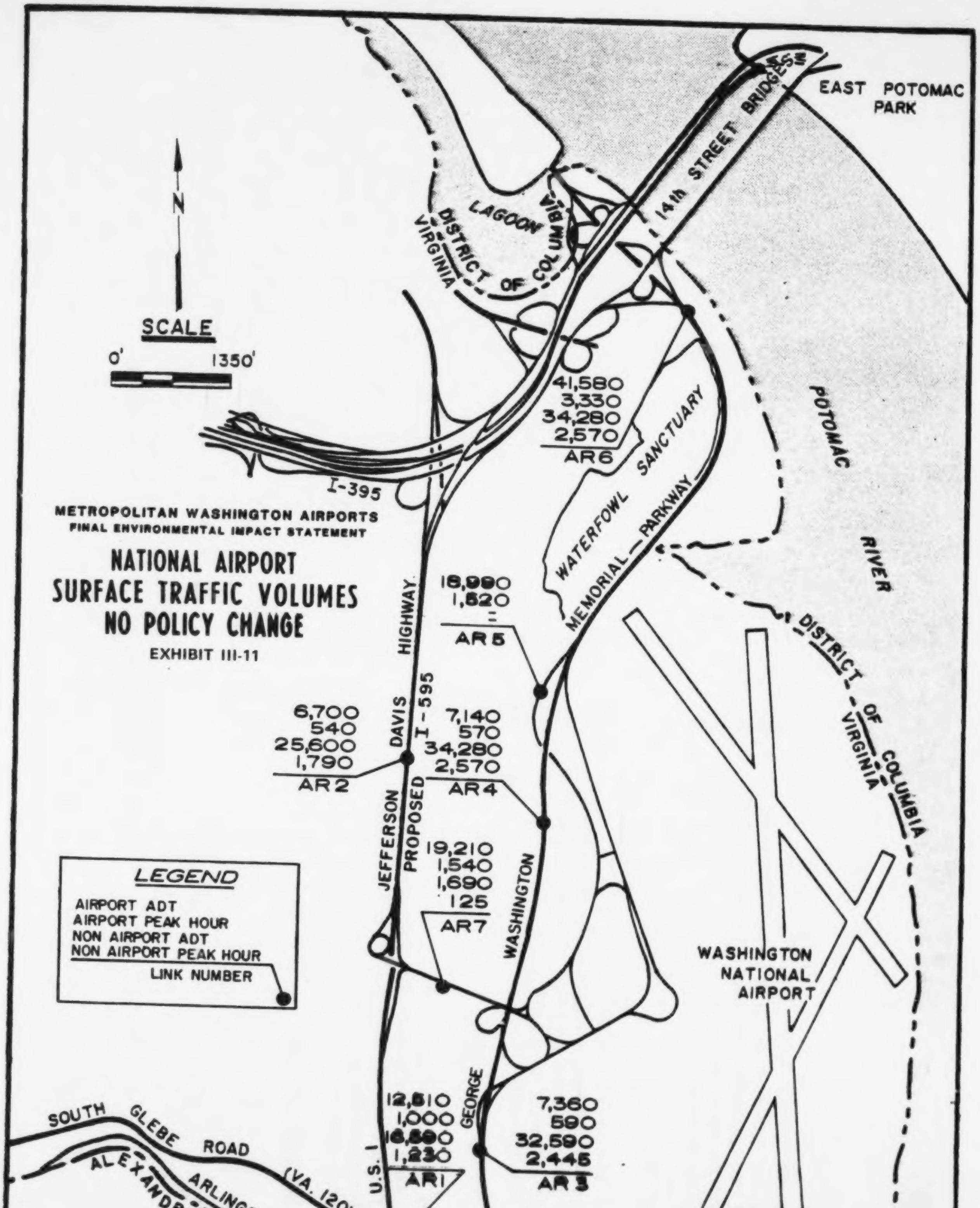
[1] Institute of Traffic Engineers, Transportation and Traffic Engineers Handbook, 1976.


EAST POTOMAC PARK
14th STREET BRIDGES
LAGOON
DISTRICT OF COLUMBIA
VIRGINIA
N
SCALE
0'
1350'
41,580
3,330
34,280
2,570
AR6
I-395
WATERFOWL SANCTUARY
MEMORIAL PARKWAY
POTOMAC RIVER
18,990
1,520
–
AR5
JEFFERSON DAVIS HIGHWAY
PROPOSED I-595
6,700
540
25,600
1,790
AR2
7,140
570
34,280
2,570
AR4
19,210
1,540
1,690
125
AR7
WASHINGTON
GEORGE
DISTRICT OF COLUMBIA
VIRGINIA
WASHINGTON NATIONAL AIRPORT
LEGEND
AIRPORT ADT
AIRPORT PEAK HOUR
NON AIRPORT ADT
NON AIRPORT PEAK HOUR
LINK NUMBER
12,510
1,000
16,590
1,230
AR1
7,360
590
32,590
2,445
AR3
U.S. 1
SOUTH GLEBE ROAD (VA. 120)
ALEXANDRIA CITY
ARLINGTON CO.

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

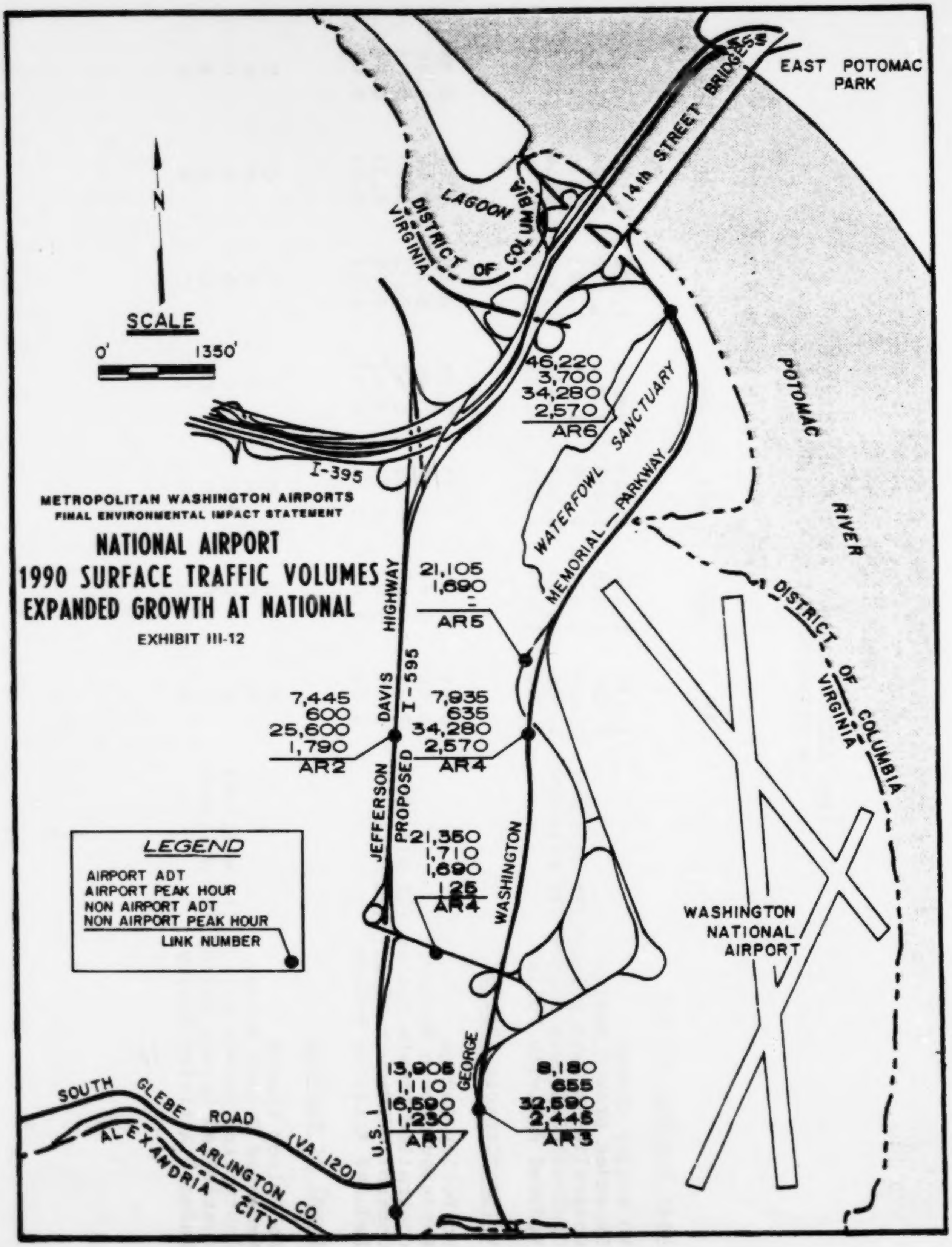
NATIONAL AIRPORT
SURFACE TRAFFIC VOLUMES
NO POLICY CHANGE

EXHIBIT III-11

TABLE III-7

1990 ACCESS ROADWAY LEVELS OF SERVICE
WASHINGTON NATIONAL AIRPORT

	ACCESS ROADWAY LINKS						
	AR1	AR2	AR3	AR4	AR5	AR6	AR7
Peak One-Way Volume							
No Policy Change	1,450	1,450	2,125	2,200	1,520	3,540	1,165
Expanded Growth Policy	1,520	1,480	2,445	2,245	1,690	3,700	1,285
Controlled Growth Policy (18 million)	1,410	1,420	2,100	2,175	1,425	3,415	1,095
Controlled Growth Policy (16 million)	1,360	1,395	2,065	2,140	1,300	3,250	1,010
Reduced Activity Policy	1,300	1,370	2,030	2,110	1,180	3,090	920
Volume/Capacity Ratio							
No Policy Change	0.65	0.65	0.53	0.55	0.76	0.59	0.78
Expanded Growth Policy	0.68	0.66	0.61	0.56	0.85	0.62	0.86
Controlled Growth Policy (18 million)	0.63	0.63	0.53	0.55	0.72	0.57	0.73
Controlled Growth Policy (16 million)	0.61	0.62	0.52	0.54	0.65	0.55	0.68
Reduced Activity Policy	0.58	0.61	0.51	0.53	0.59	0.52	0.61
Level of Service							
No Policy Change	B	B	C	C	D	C	C
Expanded Growth Policy	B	B	C	C	E	C	D
Controlled Growth Policy (18 million)	B	B	C	C	D	B	C
Controlled Growth Policy (16 million)	B	B	C	C	C	B	B
Reduced Activity Policy	A	B	C	C	C	B	B



METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

NATIONAL AIRPORT
1990 SURFACE TRAFFIC VOLUMES
EXPANDED GROWTH AT NATIONAL

EXHIBIT III-12

EAST POTOMAC PARK
14th STREET BRIDGES
LAGOON
DISTRICT OF COLUMBIA
VIRGINIA
N
SCALE
0'
1350'
46,220
3,700
34,280
2,570
AR6
WATERFOWL SANCTUARY
POTOMAC RIVER
I-395
MEMORIAL PARKWAY
21,105
1,690
-
AR5
DISTRICT OF COLUMBIA
VIRGINIA
JEFFERSON DAVIS HIGHWAY
PROPOSED I-595
7,445
600
25,600
1,790
AR2
7,935
635
34,280
2,570
AR4
LEGEND
AIRPORT ADT
AIRPORT PEAK HOUR
NON AIRPORT ADT
NON AIRPORT PEAK HOUR
LINK NUMBER
21,350
1,710
1,690
125
AR4
WASHINGTON
WASHINGTON NATIONAL AIRPORT
GEORGE
13,905
1,110
16,590
1,230
AR1
8,180
655
32,590
2,445
AR3
U.S. 1
SOUTH GLEBE ROAD (VA. 120)
ALEXANDRIA CITY
ARLINGTON CO.

Controlled Growth Policy to 18 Million Passengers at National

The Controlled Growth policy alternative to 18,000,000 annual passengers in 1990 at National is expected to increase daily airport-related vehicle flows by approximately 15.8 percent or 9,400 vehicle trips (two-way) above those experienced under the 1979 Existing Conditions.

Exhibit III-13 shows the projected airport and non-airport traffic volumes for the year 1990 under this Controlled Growth alternative plan. Table III-7 again provides a generalized review of calculated future levels of service for selected external roadway links based upon the volumes shown on Exhibit III-13. The results of the LOS assessment shown in Table III-7 indicate that two links (AR5 and AR7) could experience a reduction in the level of service over 1979 conditions (see Table III-6), while two links (AR1 and AR2) show improved levels.

Only the southbound off-ramp to National from George Washington Parkway (AR5) is below level of service "C." Link AR7 (Viaduct Route 233) drops from LOS "B" to LOS "C" under this alternative, however, that is an acceptable service level.

The improvements to the levels of service on the Route 1 segments (AR1 and AR2) are reflective of the corridor's planned upgrading by the Virginia Department of Highways and Transportation.

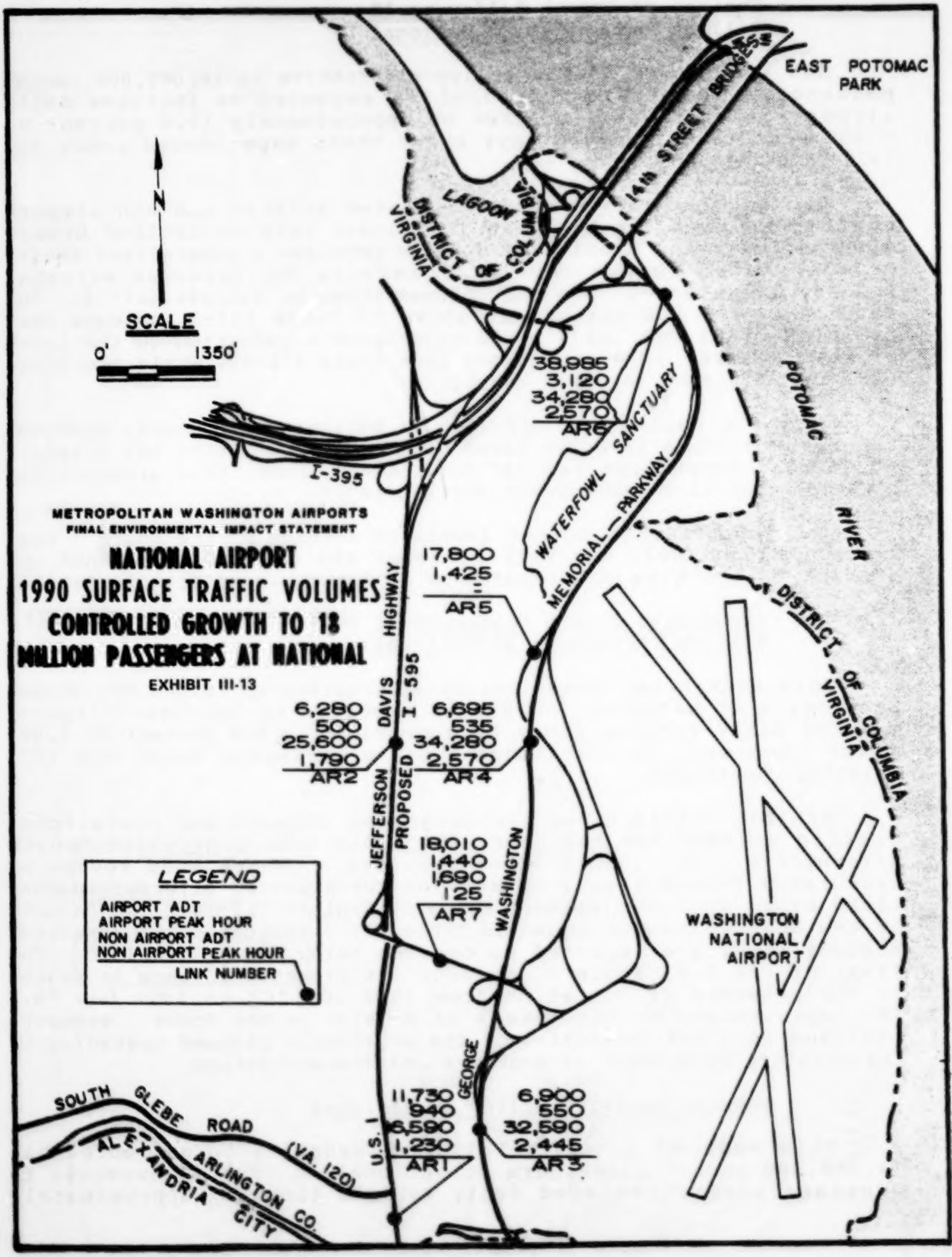
Controlled Growth Policy to 16 Million Passengers at National

This Controlled Growth Policy alternative to 16,000,000 annual passengers at National in 1990 is expected to increase airport-related daily vehicle flows by approximately 5.9 percent or 3,000 trips (two-way) in 1990 above those experienced under the 1979 Existing Conditions.

Exhibit III-14 shows the projected airport and non-airport traffic volumes for the year 1990 under this Controlled Growth alternative plan. Table III-7 provides a generalized review of calculated future levels of service for selected external roadway links based upon the volumes shown on Exhibit III-14. The results of the LOS assessment shown in Table III-7 indicate that no access roadway links are expected to operate below LOS "C" in 1990. Two links of the U.S. Route 1 corridor are expected to show increases in their levels of operation from 1979 LOS "C" to 1990 LOS "B." The improvements to the levels of service on the Route 1 segments (AR1 and AR2) are reflective of the corridor's planned upgrading by the Virginia Department of Highways and Transportation.

Reduced Activity Policy at National

This Reduced Activity Policy alternative to not more than 14,000,000 annual passengers at National in 1990 is expected to decrease airport-related daily vehicle flows by approximately

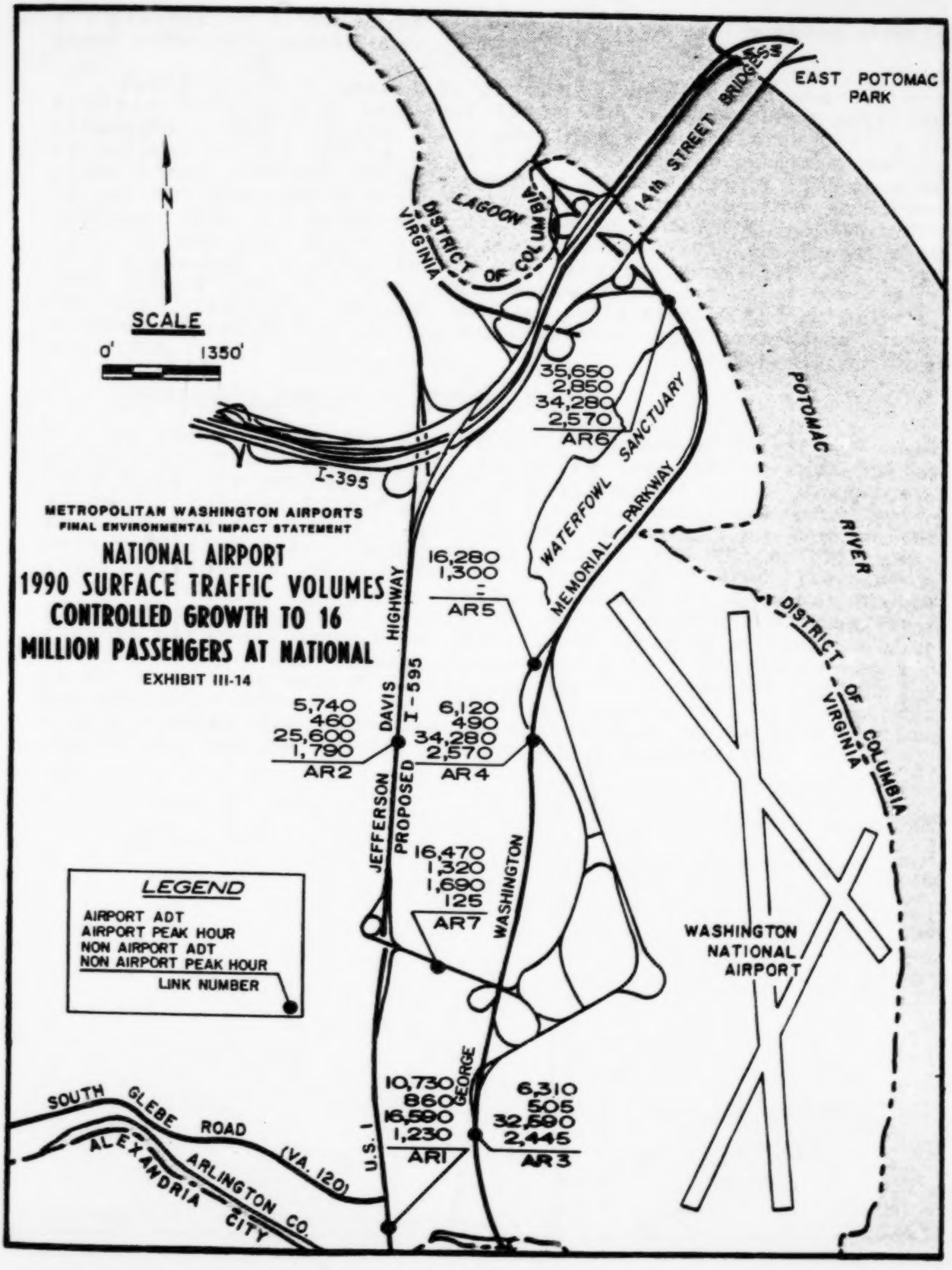


METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

NATIONAL AIRPORT
1990 SURFACE TRAFFIC VOLUMES
CONTROLLED GROWTH TO 18
MILLION PASSENGERS AT NATIONAL

EXHIBIT III-13

EAST POTOMAC PARK
14th STREET BRIDGES
LAGOON
DISTRICT OF COLUMBIA
VIRGINIA
N
SCALE
0'
1350'
38,985
3,120
34,280
2,570
AR6
POTOMAC RIVER
WATERFOWL SANCTUARY
MEMORIAL PARKWAY
I-395
17,800
1,425
AR5
DISTRICT OF COLUMBIA
VIRGINIA
JEFFERSON DAVIS HIGHWAY
PROPOSED I-595
6,280
500
25,600
1,790
AR2
6,695
535
34,280
2,570
AR4
18,010
1,440
1,690
125
AR7
GEORGE WASHINGTON
WASHINGTON NATIONAL AIRPORT
LEGEND
AIRPORT ADT
AIRPORT PEAK HOUR
NON AIRPORT ADT
NON AIRPORT PEAK HOUR
LINK NUMBER
11,730
940
6,590
1,230
AR1
6,900
550
32,590
2,445
AR3
U.S. 1
SOUTH GLEBE ROAD (VA. 120)
ALEXANDRIA CITY
ARLINGTON CO.



METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

NATIONAL AIRPORT
1990 SURFACE TRAFFIC VOLUMES
CONTROLLED GROWTH TO 16
MILLION PASSENGERS AT NATIONAL

EXHIBIT III-14

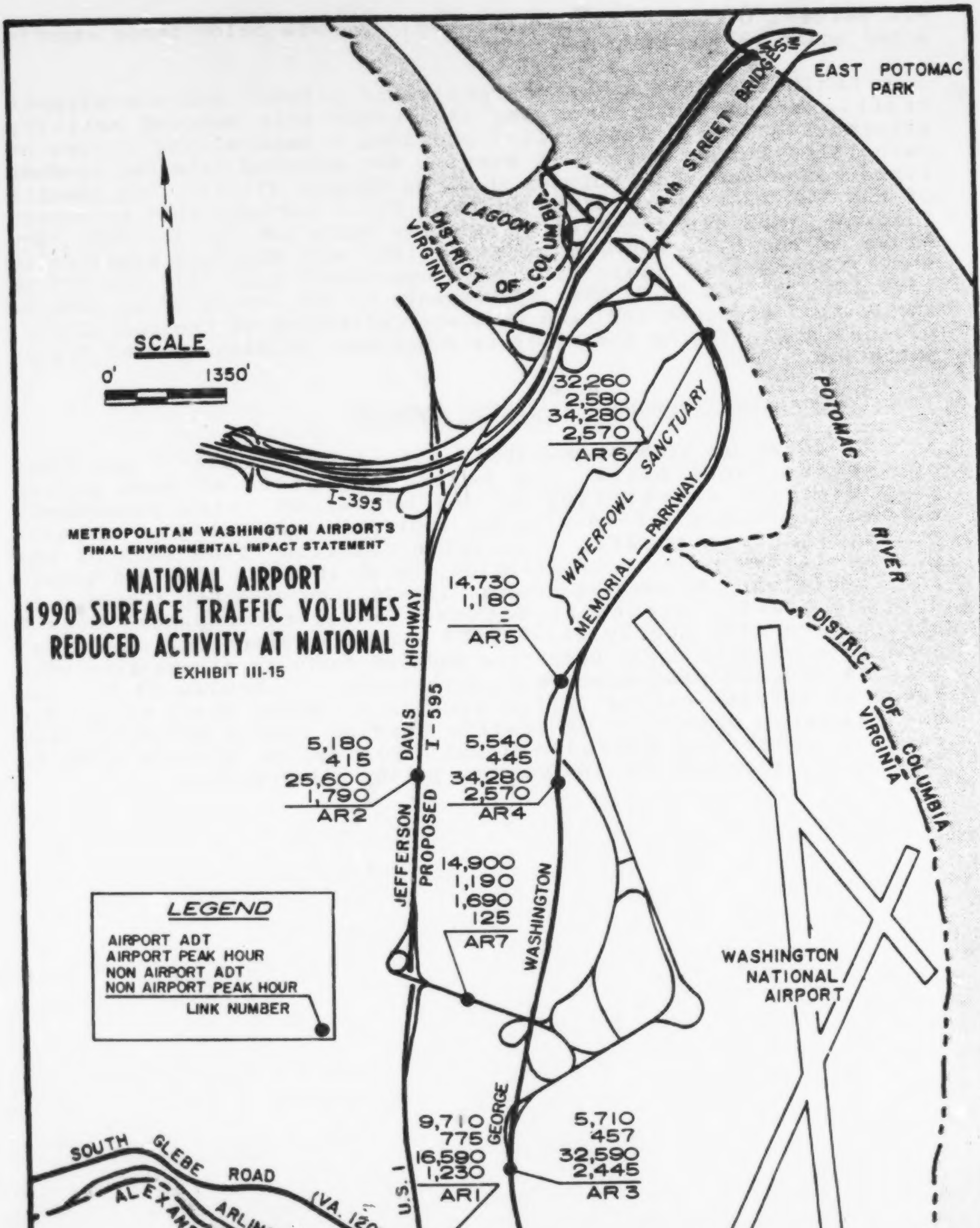
N
SCALE
0'
1350'
LEGEND
AIRPORT ADT
AIRPORT PEAK HOUR
NON AIRPORT ADT
NON AIRPORT PEAK HOUR
LINK NUMBER
EAST POTOMAC PARK
14th STREET BRIDGES
LAGOON
DISTRICT OF COLUMBIA
VIRGINIA
I-395
35,650
2,850
34,280
2,570
AR6
WATERFOWL SANCTUARY
MEMORIAL PARKWAY
POTOMAC RIVER
16,280
1,300
-
AR5
DISTRICT OF COLUMBIA
VIRGINIA
JEFFERSON DAVIS HIGHWAY
PROPOSED I-595
5,740
460
25,600
1,790
AR2
6,120
490
34,280
2,570
AR4
16,470
1,320
1,690
125
AR7
GEORGE WASHINGTON
WASHINGTON NATIONAL AIRPORT
10,730
860
16,590
1,230
AR1
6,310
505
32,590
2,445
AR3
U.S. 1
SOUTH GLEBE ROAD (VA. 120)
ALEXANDRIA CITY
ARLINGTON CO.

4.2 percent or 2,500 trips (two-way) in 1990 below those experienced under 1979 conditions.

Exhibit III-15 shows the projected airport and non-airport traffic volumes for the year 1990 under this Reduced Activity alternative plan. Table III-7 provides a generalized review of calculated future levels of service for selected external roadway links based upon the volumes shown on Exhibit III-15. The results of the LOS assessment shown in Table III-7 indicate that no access roadway links are expected to operate below LOS "C" in 1990. Two links of the U.S. Route 1 corridor (AR1 and AR2) are expected to show increases in their levels of operation from 1979 LOS "C" to 1990 LOS "A" and "B." The improvements to the levels of service on the Route 1 segments (AR1 and AR2) are reflective of the corridor's planned upgrading by the Virginia Department of Highways and Transportation.

Comparative Summary of Traffic Impacts

As shown on traffic Exhibits III-11 through III-15 and level of service Table III-7, the relative impacts of each policy vary directly in relation to the number of total passengers allowed. Exhibit III-16 provides a graphic comparison of airport-related surface traffic generation resulting from each of the policy options under consideration, in addition to the 1979 Existing Condition. As seen in Exhibit III-16, the greatest increase in surface traffic occurs at National under the Expanded Growth alternative with nearly 21,750,000 annual passengers. The least impacts obviously occur under the Reduced Activity alternative with only 14,000,000 passengers allowed annually. Review of the two level of service tables (III-6 and III-7) shows that, except for the dramatic reduction of traffic service levels on one access roadway under the Expanded Growth Policy, no serious traffic impacts are expected for the various policy alternatives.

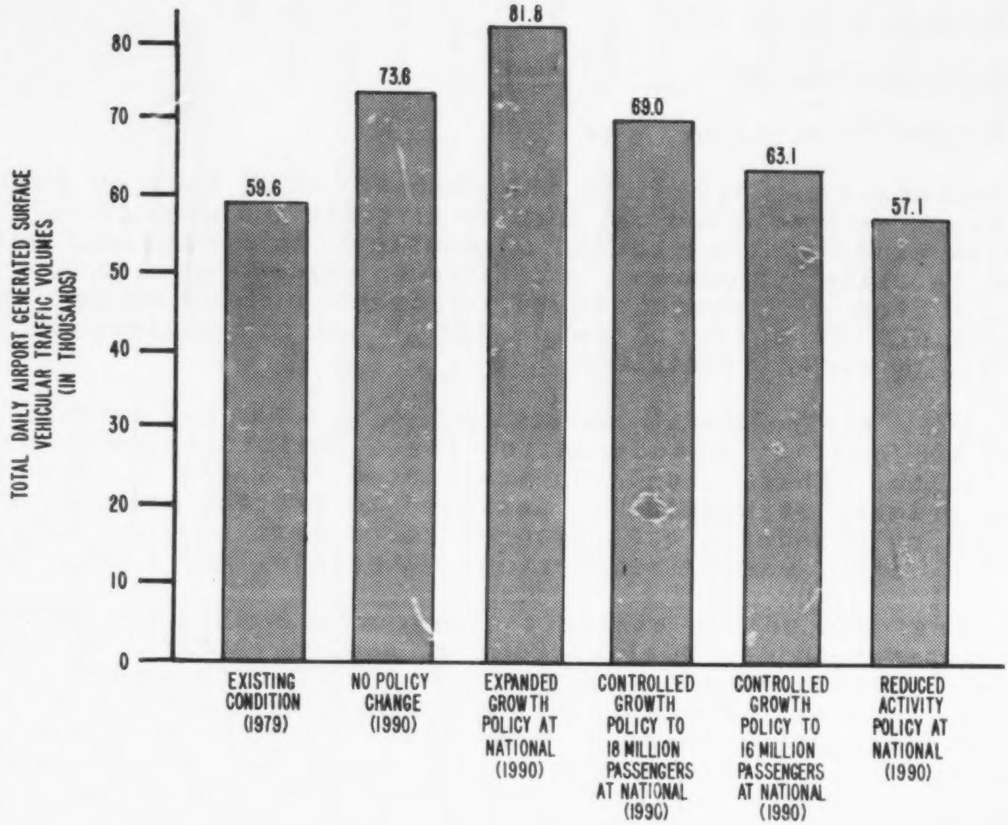


METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

NATIONAL AIRPORT
1990 SURFACE TRAFFIC VOLUMES
REDUCED ACTIVITY AT NATIONAL

EXHIBIT III-15

N
SCALE
0'
1350'
EAST POTOMAC PARK
14th STREET BRIDGES
LAGOON
DISTRICT OF COLUMBIA
VIRGINIA
POTOMAC RIVER
I-395
32,260
2,580
34,280
2,570
AR6
WATERFOWL SANCTUARY
MEMORIAL PARKWAY
14,730
1,180
AR5
DISTRICT OF COLUMBIA
VIRGINIA
JEFFERSON DAVIS HIGHWAY
PROPOSED I-595
5,180
415
25,600
1,790
AR2
5,540
445
34,280
2,570
AR4
14,900
1,190
1,690
125
AR7
GEORGE WASHINGTON
WASHINGTON NATIONAL AIRPORT
LEGEND
AIRPORT ADT
AIRPORT PEAK HOUR
NON AIRPORT ADT
NON AIRPORT PEAK HOUR
LINK NUMBER
9,710
775
16,590
1,230
AR1
5,710
457
32,590
2,445
AR3
U.S. 1
SOUTH GLEBE ROAD (VA. 120)
ALEXANDRIA CITY
ARLINGTON CO.



METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

ALTERNATIVE SURFACE TRAFFIC COMPARISONS AT NATIONAL

EXHIBIT III-16

AIR QUALITY

Introduction and Methodology

The principal air pollutants resulting from airport and aircraft operations are:

- Carbon Monoxide (CO)
- Hydrocarbons (HC)
- Oxides of Nitrogen (NO_x)

These pollutants evolve from the combustion of fuel by mobile sources such as piston and gas turbine aircraft and airport-related automobile traffic. The action of sunlight on atmospheric emissions of reactive hydrocarbons and nitrogen oxides can also lead to the production of photochemical oxidants such as ozone (O_3). Small amounts of sulfur dioxide (SO_2) and particulate matter are emitted by airport activity.

The U.S. Environmental Protection Agency (EPA) has established ambient air quality standards for these pollutants to protect public health. These standards are listed in Table III-8. The national primary standards are designed to protect human health, and secondary standards are designed to protect against harmful effects on soil, water, vegetation, materials, and visibility.

National and Dulles airports are located within the National Capital Interstate Air Quality Control Region (AQCR). This AQCR includes Prince Georges and Montgomery Counties in Maryland; Arlington, Fairfax, Loudoun, and Prince William Counties, and the cities of Alexandria, Fairfax, and Falls Church in Virginia; and the District of Columbia. This entire region has been designated as "non-attainment" for ozone, indicating that violations of the standard for ozone have been measured. National Airport, located within a high-density traffic area, is also non-attainment for carbon monoxide and total suspended particulates (TSP). Dulles Airport, in rural Virginia, is either attainment or unclassified for the remaining pollutants.

The State Implementation Plan (SIP) represents the mechanism for dealing with non-attainment designations. Each state is required by the Federal EPA to detail its strategies concerning the attainment, maintenance, and enforcement of air quality standards in the SIP. Under the Clean Air Act Amendments of 1977, the SIP must be revised to provide for the attainment of the sulfur dioxide and particulate matter standards by December 31, 1982. Attainment of the carbon monoxide and oxidant standards may be delayed until December 31, 1987.

TABLE III-8

NATIONAL AMBIENT AIR QUALITY STANDARDS

		National Standards	
Pollutant	Averaging Time	Primary[a]	Secondary[b]
Sulfur Dioxide	Annual Arithmetic Mean	$80 \mu g/m^3$ (0.03 ppm)	$60 \mu g/m^3$ (0.02 ppm)
	Twenty-four Hour Average[c]	$365 \mu g/m^3$ (0.14 ppm)	$260 \mu g/m^3$ (0.10 ppm)
	Three-hour Average		$1300 \mu g/m^3$ (0.50 ppm)
Particulate Matter	Annual Geometric Mean	$75 \mu g/m^3$	$60 \mu g/m^3$
	Twenty-four Hour Average[c]	$260 \mu g/m^3$	$150 \mu g/m^3$
Carbon Monoxide	Eight-hour Average[c]	$10 mg/m^3$ (9 ppm)	$10 mg/m^3$ (9 ppm)
	One-hour Average[c]	$40 mg/m^3$ (35 ppm)	$40 mg/m^3$ (35 ppm)
Ozone	One-hour Average[c]	$240 \mu g/m^3$ (0.12 ppm)	$240 \mu g/m^3$ (0.12 ppm)
Hydrocarbons	Three-hour Average (6 - 9 a.m.)[c]	$160 \mu g/m^3$ (0.24 ppm)	$160 \mu g/m^3$ (0.24 ppm)
Nitrogen Dioxide	Annual Arithmetic Mean	$100 \mu g/m^3$ (0.05 ppm)	$100 \mu g/m^3$ (0.05 ppm)
Lead	Thirty-day Average	$1.5 \mu g/m^3$	$1.5 \mu g/m^3$

[a] Primary standards are designed to protect public health.

[b] Secondary standards are designed to protect against effects on soil, water, vegetation, materials, animals, weather, visibility, and personal comfort and well-being.

[c] Not to be exceeded more than once per year.

Study Methodology

Assessment of the air quality impacts of the proposed alternatives at National and Dulles airports includes two major tasks. An inventory of total pollutant emissions has been prepared to indicate the regional effects of each alternative. Predictions of existing and ambient pollutant concentrations are provided to permit comparison with the air quality standards.

This assessment has been prepared to examine the major mobile source-related pollutants. Particulate matter is included though it is emitted only in small quantities from airport operations. Oxidant formation is primarily due to emission of reactive hydrocarbons and nitrogen oxides, therefore, emission burdens of these pollutants are provided as a guideline of the airport contribution to the formation of photochemical oxidants.

The air quality analysis has been developed to include emission sources related to airport activity. The analysis is presented in terms of total airport-related emission loadings for all pollutants. This was calculated on a daily basis for the 1979 existing condition, and for 1990 with the various policy alternatives at National, Dulles and Baltimore-Washington airports. The emission inventory examined the production of pollutants from aircraft and automobile traffic.

Emissions from aircraft were determined based on aircraft operational data (number of each type) and on the time the aircraft spends in each mode of its landing and takeoff cycle (LTO). The principal pollutants emitted from aircraft engines are oxides of nitrogen, carbon monoxide, hydrocarbons, and particulates. Emissions of carbon monoxide and hydrocarbons are especially high during idle and taxi operations, while oxides of nitrogen and particulate emissions are usually greatest during takeoff and landing.

Regulations to control aircraft emissions were first announced in 1973,[1] and were revised in 1978.[2] These revisions reflect a relaxation of the original regulations and include the elimination of the emission controls for all opposed piston aircraft engines and auxiliary power units (APU).[3] Emission rates for aircraft were determined from the U.S. Environmental Protection Agency (EPA) manual AP-42.[1] To insure a conservative approach, it was assumed that the 1990 aircraft emission characteristics would be unchanged from the present.

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[1] U.S. General Services Administration, Federal Register, Vol. 38, No. 136 - Tuesday, July 17, 1973.

[2] U.S. General Services Administration, Federal Register, Vol. 43, No. 58 - Friday, March 24, 1978.

[3] U.S. General Services Administration, Federal Register, Vol. 45, No. 4 - Monday, January 7, 1980.

In addition to aircraft emissions, there are emissions due to motor vehicle traffic travelling to and from the airport. Volumes of airport-related vehicular traffic were determined by applying the vehicle trip generation rate to the projected level of passenger originations at each airport. A description of mode split and vehicle distribution parameters for air passengers and employees is contained in the Surface Access section presented pre viously. Traffic volumes for the Friday peak periods were calculated for roadway links in the vicinity of each airport. The analysis of ground access vehicle emissions was based on the emission rates of the various types of vehicles, the vehicle mix by type and model year, the average trip lengths, and the average vehicle speed. These emissions were determined for each airport based upon origins and destinations of vehicle trips at each airport. Emission rates were adjusted to reflect the changes included in the Clean Air Act Amendments of 1977.[2] Vehicle speeds of 35 mph, the national vehicle mix, and twenty percent of the access vehicle operations in the cold-start mode were assumed in computing emission factors.

The tabulation of total emission inventories permitted identification of the best and worst cases at each of the airports for further examination in the dispersion modeling phase of the analysis. Dispersion models are mathematical programs which accept data on emissions, airport layout, and meteorology to compute the dispersion of pollutants by the atmosphere, and to produce output data on the concentration of pollutants for specified time periods. Thus, the dispersion model is a mechanism for translating emission data into ambient air quality data. This permits comparison of airport-generated concentrations with the national standards.

In computing ambient ground level concentrations, extensive use was made of the Airport Vicinity Air Pollution (AVAP) model, developed by Argonne National Laboratory for the FAA. The AVAP model consists of a set of pollutant emission models and a set of dispersion models. The emission models are used to compute hourly emissions due to aircraft and airport activity. The output of the emission model is used as input to the air pollutant dispersion package, which consists of a set of models used to compute dispersion from point, line, and area sources.[1]

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[1] U.S. Environmental Protection Agency, Compliation of Air Pollutant Emission Factors (Second Edition), April, 1973, pp. 3.2.1-6 - 3.2.1-8.

[2] U.S. Environmental Protection Agency, Mobile Source Emission Factors, January, 1978.

This model has been found to be a good predictor of aircraft and vehicle emissions, and short-term pollutant concentrations, though it is less reliable in predicting stationary source emissions and long-term pollutant concentrations.[2] However, these weaknesses did not represent obstacles to the modeling program. The AVAP model was utilized in a manner which isolated policy-dependent airport-related emission sources only. In this way, emissions from on-site and off-site stationary sources were not specifically examined, but were included in estimates of concentrations attributable to non-airport sources. The non-airport-related concentrations were compiled from several sources[3] and are tabulated in Appendix B of this report.

Minor modifications were made to the basic AVAP program to permit more input detail in two areas. First, traffic volumes for each hour of analyses were input rather than estimated. Secondly, the aircraft departure distribution was input to the program instead of being computed from arrival times and gate occupancy times.

Meterological inputs to the model were presented to represent an examination of worst case conditions. These included a 1 meter/second wind speed, a 300 meter mixing height, Pasquill Stability Class E, and a set of wind directions designed to accumulate pollutants at receptor points in the vicinity of the airport. These conditions are representative of the atmospheric temperature inversions which form due to the influence of slow-moving high-pressure centers, and which typically produce the highest pollutant concentrations throughout the Middle Atlantic area.

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[1] I.T. Wang, et al., Airport Vicinity Air Pollution Study - Model Application and Validation, U.S. Department of Transportation, July, 1974.

[2] J.M. Haber, A Study of Computer Models for Predicting Air Pollution from Airports.

[3] Metropolitan Washington Council of Governments, Air Quality in the National Capital Interstate Air Quality Region, 1976, June 1977.
-Metropolitan Washington Council of Governments, Air Quality Implications of Growth Forecasts: 1980, 1985, 1995, March, 1977.
-Annual Report on the Quality of the Air in Washington, D.C. 1976, Bureau of Air & Water Quality.
-State of Virginia, Aurora Hills Monitoring Station.
-Fairfax County Air Quality, Annual Summary, 1979.
-Peat, Marwick, Mitchell and Company, Environmental Impact Assessment - Master Plan Report, Dulles International Airport, September, 1977.

The following portions of this subsection present the results of the air quality analysis for the 1979 existing conditions and projected conditions in 1990 under each of the proposed alternatives. These analyses were performed for carbon monoxide (CO), total hydrocarbons (THC), oxides of nitrogen (NO_x), and total suspended particulates (TSP). Both total emissions and concentrations are presented as part of the impact assessment.

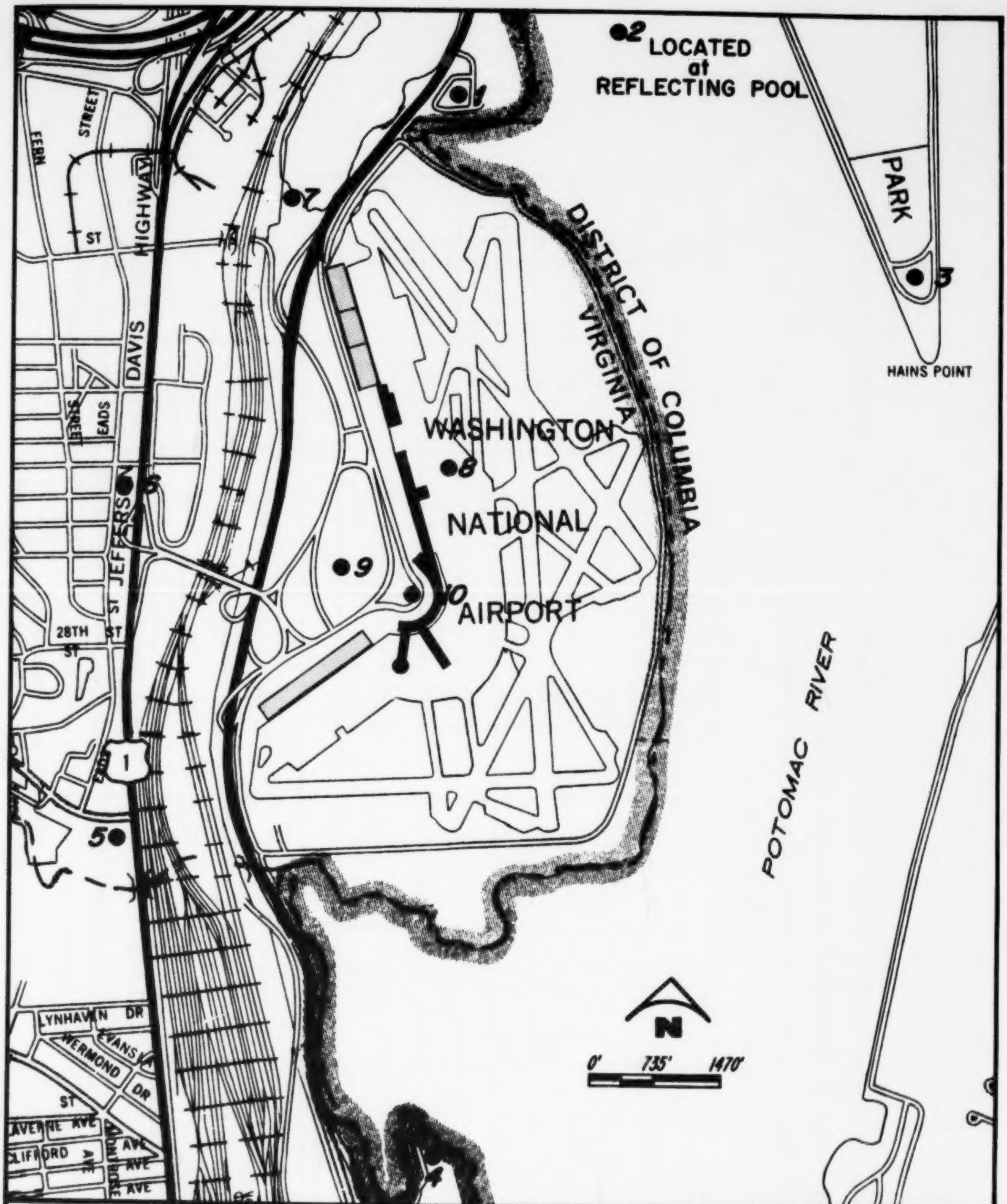
Existing Conditions

In order to assess the airport-related pollutant concentrations both on- and off-site, ten receptor points were chosen. These receptor points are located in apron areas, areas of moderate to high pedestrian activity, and also at nearby off-airport sites. The locations are shown on Exhibit III-17. Receptor points 1 through 7 are located off airport property, while point 8 is situated in the apron area, point 9 in the parking area, and point 10 near the traffic circle behind the main terminal building.

Table III-9 summarizes the estimated concentrations at each receptor point for 1979. The highest airport-related levels of all pollutants occur on the airport property on the main parking lot, the aircraft aprons, and in front of the main terminal building. The highest off-site airport-related concentrations occur to the north and west of the airport at receptor points 1, 6, and 7. Receptor point 9, located in the middle of the main parking area is the peak on-site receptor due to the close proximity to the terminal parking lots and to the airfield. At this receptor, pollutant levels are due mainly to automobile-oriented activity. It should be emphasized that, except for receptor point 1, automobiles and ground service vehicles are the dominant sources of carbon monoxide.

Comparison of existing total concentrations with national standards and guidelines shows that the eight-hour carbon monoxide standard, is violated at several receptor points, and the three-hour hydrocarbon guideline is violated at every receptor point. Additionally, the annual average nitrogen dioxide standard is violated at off-site receptor points 1 and 7, and at on-site receptor points 8, 9, and 10. No violations of the one-hour carbon monoxide or primary particulate standards were found.

In addition to modeling air pollutant concentrations, aircraft emissions, in terms of total loads, were also calculated for the existing condition. The total emissions generated during the landing/takeoff cycle for all aircraft on a typical day at National amounts to 27,170 pounds. This value provides a basis from which total aircraft emissions of the policy alternatives can be compared. An emission inventory showing the combined effects of automobile and aircraft activity is presented in Table III-10.


●2 LOCATED at REFLECTING POOL
1
PARK
3
HAINS POINT
FERN
STREET
JEFFERSON DAVIS HIGHWAY
ST
7
DISTRICT OF COLUMBIA
VIRGINIA
EADS
STREET
6
WASHINGTON
8
NATIONAL
9
10
AIRPORT
28TH ST
ST
1
5
POTOMAC RIVER
N
0' 735' 1470'
LYNHAVEN DR
EVANS LA
HERMOND DR
ST
LAVERNE AVE
CLIFFORD AVE
AVE
AVE
4

LEGEND

●*3* RECEPTOR POINTS

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

AIR QUALITY RECEPTOR POINTS
NATIONAL AIRPORT

EXHIBIT III-17

TABLE III-9

EXISTING (1979) MAXIMUM POLLUTANT CONCENTRATIONS IN VICINITY OF WASHINGTON NATIONAL AIRPORT[4]

	CARBON MONOXIDE (ppm)		TOTAL HYDROCARBONS[3] (ppm)	NITROGEN DIOXIDE (ppm)	TOTAL SUSPENDED PARTICULATES ($\mu g/m^3$)	
AVERAGING TIME	ONE-HOUR	EIGHT-HOUR	6-9 A.M. AVERAGE	ANNUAL AVERAGE	24-HOUR AVERAGE	ANNUAL GEOMETRIC MEAN
FEDERAL AIR QUALITY STANDARD	35	9	0.24	0.05	260	75
NON-AIRPORT RELATED CONCENTATIONS	10.8	7.4	2.403	0.022	132.5	48.4
RECEPTOR POINT[1]						
1 Airport-Related	2.7	1.9	0.525	0.047	14.8	2.6
Total[2]	13.5	9.3	2.928	0.069	147.3	51.0
2 Airport-Related	0.6	0.5	0.097	0.007	1.9	0.4
Total[2]	11.4	7.9	2.500	0.029	134.4	48.8
3 Airport-Related	0.9	0.8	0.158	0.005	1.8	0.4
Total[2]	11.7	8.2	2.561	0.027	134.3	48.8
4 Airport-Related	0.6	0.4	0.117	0.006	2.3	0.5
Total[2]	11.4	7.8	2.520	0.028	134.8	48.9
5 Airport-Related	1.0	0.5	0.150	0.008	4.0	0.7
Total[2]	12.5	8.6	2.553	0.030	136.0	49.0
6 Airport-Related	2.5	1.9	0.343	0.008	3.1	0.6
Total[2]	12.5	8.6	2.746	0.030	136.0	49.0
7 Airport-Related	2.4	2.4	0.411	0.032	9.2	1.9
Total[2]	13.2	9.8	2.814	0.054	141.7	50.3
8 Airport-Related	4.1	3.6	0.474	0.040	13.3	2.5
Total[2]	14.9	11.0	2.877	0.062	145.8	50.9
9 Airport-Related	6.8	5.5	0.780	0.042	6.4	1.0
Total[2]	17.6	12.9	3.183	0.064	138.9	49.4
10 Airport-Related	5.2	2.3	0.622	0.034	11.9	2.0
Total[2]	16.0	9.7	3.025	0.056	144.4	50.4

---

[1] See Exhibit III-17 for receptor point locations.

[2] See Table B-1 in Appendix B for non-airport-related concentrations.

[3] This value is a guideline for attainment of the ozone standard.

[4] Increased aircraft activity and airport-related traffic accounts for the increased pollutant levels presented for the 1979 existing case as compared with the 1976 existing condition presented in the DEIS.

Impacts of Policy Alternatives

The level of pollutant concentrations for the alternative policy options vary as a result of three key considerations: the number of passengers allowed to use the facility, the number of widebody aircraft in the mix (widebody aircraft generally emit higher amounts of air contaminants than other aircraft,) and the total number of daily air carrier aircraft. As each of these factors increases, emissions increase.

In order to provide a comparison of pollutant emissions resulting from each of the policy alternatives, a series of tables has been developed. The documentation listed in Tables III-11 through III-15 provide the concentrations estimated to occur at each of the representative receptor sites for each of the policy alternatives. In order to assess the total pollutant impact upon a particular receptor, a non-airport related concentration was provided for each receptor. In the case of carbon monoxide (CO) and total suspended particulates (TSP), a range of non-airport-related concentrations were available, and, hence were presented in the tables to give a better overall view of the air quality of the area. This information is intended to provide data in a form which can be readily compared to standards.

It should be noted that this air quality analysis has assumed a "worst Case" condition on airport property as it was assumed that by 1990 no changes to the internal airport roadway system would be made. With the adoption of a policy, airport master planning could be undertaken and improvements to the roadway system could then proceed, thus the higher pollutant concentrations at receptor points could be expected to reduce from those shown in the tables.

Comparative Summary of Air Quality Impacts

For ease in assimilating this data and comparing alternatives, the total daily emissions generated by aircraft at National was calculated for each alternaive and is shown on Exhibit III-18. As can be seen in this exhibit, the largest emission loads occur with the Expanded Growth alternative with the smallest amount occurring with the Reduced Activity case.

Airport-related traffic emissions were calculated based upon automobile traffic traveling within the region to National Airport. Table III-10 presents the sum of airport-related traffic and aircraft total daily emissions. These total daily emission loadings follow the trends set forth by aircraft activity only; that is, the largest total emission loads occur with the Expanded Growth alternative and the smallest totals occur under the Reduced Activity at National alternative.

TABLE III-10

EMISSION INVENTORY FOR NATIONAL AIRPORT[a]

(pounds per day)

	PARTICULATES	SULFUR OXIDES	CARBON MONOXIDE	HYDROCARBONS	NITROGEN OXIDES	TOTAL
Existing (1979)	984	904	31,764	6,081	10,661	50,394
Reduced Activity Policy at National	992	816	33,414	5,585	10,874	51,681
Controlled Growth Policy to 16 Million at National	1,055	875	36,055	6,099	11,465	55,549
Controlled Growth Policy to 18 Million at National	1,165	877	39,712	6,806	12,948	61,507
No Policy Change at National	1,189	1,258	41,544	7,264	12,908	64,162
Expanded Growth Policy at National	1,386	1,365	47,459	8,284	15,887	74,381

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[a] Includes emissions from aircraft and airport-related traffic.

TABLE III-11
PROJECTED (1990) MAXIMUM POLLUTANT CONCENTRATIONS IN VICINITY OF WASHINGTON NATIONAL AIRPORT
(No Policy Change at National)

	CARBON MONOXIDE (ppm)				TOTAL HYDROCARBONS[3] (ppm)	NITROGEN DIOXIDE (ppm)	TOTAL SUSPENDED PARTICULATES ($\mu g/m^3$)			
AVERAGING TIME	ONE-HOUR		EIGHT-HOUR		6-9 A.M. AVERAGE	ANNUAL AVERAGE	24-HOUR AVERAGE		ANNUAL GEOMETRIC MEAN	
FEDERAL AIR QUALITY STANDARD	35		9		0.24	0.05	260		75	
NON-AIRPORT RELATED CONCENTATIONS	2.6	7.8	1.7	5.2	1.833	0.032	137	208	50	75
RECEPTOR POINT[1]										
1 Airport-Related	4.3		3.3		0.809	0.054	29.9		5.5	
Total[2]	6.9	12.1	5.0	8.5	2.642	0.086	166.9	237.9	55.5	80.5
2 Airport-Related	0.8		0.6		0.121	0.010	4.3		0.8	
Total[2]	3.4	8.6	2.3	5.8	1.954	0.042	141.3	212.3	50.8	75.8
3 Airport-Related	1.0		0.8		0.184	0.008	3.6		0.7	
Total[2]	3.6	8.8	2.5	6.0	2.017	0.040	140.6	211.6	50.7	75.7
4 Airport-Related	0.9		0.5		0.173	0.009	5.9		1.0	
Total[2]	3.5	8.7	2.2	5.7	2.006	0.041	142.9	213.9	51.0	76.0
5 Airport-Related	1.4		0.5		0.192	0.010	6.0		1.1	
Total[2]	4.0	9.2	2.2	5.7	2.025	0.042	143.0	214.0	51.1	76.1
6 Airport-Related	2.0		1.6		0.389	0.007	6.1		1.0	
Total[2]	4.6	9.8	3.3	6.8	2.222	0.039	143.1	214.1	51.0	76.0
7 Airport-Related	2.5		2.0		0.514	0.003	17.8		3.0	
Total[2]	5.1	10.3	3.7	7.2	2.347	0.035	154.8	225.8	53.0	78.0
8 Airport-Related	3.7		3.3		0.547	0.043	20.2		3.6	
Total[2]	6.3	11.5	5.0	8.5	2.380	0.075	157.2	228.2	53.6	78.6
9 Airport-Related	4.4		3.1		0.663	0.023	12.7		2.2	
Total[2]	7.0	12.2	4.8	8.3	2.496	0.055	149.7	220.7	52.2	77.2
10 Airport-Related	7.7		3.8		1.359	0.044	28.7		5.3	
Total[2]	10.3	15.5	5.5	9.0	3.192	0.076	165.7	236.7	55.3	80.3

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[1] See Exhibit III-17 for receptor point locations.

[2] See Table B-1 in Appendix B for non-airport-related concentrations.

[3] This value is a guideline for attainment of the ozone standard.

TABLE III-12
PROJECTED (1990) MAXIMUM POLLUTANT CONCENTRATIONS IN VICINITY OF WASHINGTON NATIONAL AIRPORT
(Expanded Growth Policy at National)

<table>
<tr><th></th><th colspan="4">CARBON MONOXIDE (ppm)</th><th>TOTAL HYDROCARBONS^3 (ppm)</th><th>NITROGEN DIOXIDE (ppm)</th><th colspan="4">TOTAL SUSPENDED PARTICULATES (µg/m^3)</th></tr>
<tr><th>AVERAGING TIME</th><th colspan="2">ONE-HOUR</th><th colspan="2">EIGHT-HOUR</th><th>6-9 A.M. AVERAGE</th><th>ANNUAL AVERAGE</th><th colspan="2">24-HOUR AVERAGE</th><th colspan="2">ANNUAL GEOMETRIC MEAN</th></tr>
<tr><td>FEDERAL AIR QUALITY STANDARD</td><td colspan="2">35</td><td colspan="2">9</td><td>0.24</td><td>0.05</td><td colspan="2">260</td><td colspan="2">75</td></tr>
<tr><td>NON-AIRPORT RELATED CONCENTATIONS</td><td>2.6</td><td>7.8</td><td>1.7</td><td>5.2</td><td>1.833</td><td>0.032</td><td>137</td><td>208</td><td>50</td><td>75</td></tr>
<tr><td>RECEPTOR POINT[1]</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>1 Airport-Related</td><td colspan="2">4.2</td><td colspan="2">3.2</td><td>0.772</td><td>0.051</td><td colspan="2">28.5</td><td colspan="2">5.3</td></tr>
<tr><td>Total[2]</td><td>6.8</td><td>12.0</td><td>4.9</td><td>8.4</td><td>2.605</td><td>0.083</td><td>165.5</td><td>236.5</td><td>55.3</td><td>80.3</td></tr>
<tr><td>2 Airport-Related</td><td colspan="2">0.8</td><td colspan="2">0.6</td><td>0.117</td><td>0.009</td><td colspan="2">4.1</td><td colspan="2">0.7</td></tr>
<tr><td>Total[2]</td><td>3.4</td><td>8.6</td><td>2.3</td><td>5.8</td><td>1.950</td><td>0.041</td><td>141.1</td><td>112.1</td><td>50.7</td><td>75.7</td></tr>
<tr><td>3 Airport-Related</td><td colspan="2">1.0</td><td colspan="2">0.9</td><td>0.182</td><td>0.008</td><td colspan="2">3.6</td><td colspan="2">0.7</td></tr>
<tr><td>Total[2]</td><td>3.6</td><td>8.8</td><td>2.6</td><td>6.1</td><td>2.015</td><td>0.040</td><td>140.6</td><td>211.6</td><td>50.7</td><td>75.7</td></tr>
<tr><td>4 Airport-Related</td><td colspan="2">0.9</td><td colspan="2">0.5</td><td>0.167</td><td>0.009</td><td colspan="2">5.7</td><td colspan="2">1.0</td></tr>
<tr><td>Total[2]</td><td>3.5</td><td>8.7</td><td>2.2</td><td>5.7</td><td>2.000</td><td>0.041</td><td>142.7</td><td>213.7</td><td>51.0</td><td>76.0</td></tr>
<tr><td>5 Airport-Related</td><td colspan="2">1.1</td><td colspan="2">0.6</td><td>0.188</td><td>0.009</td><td colspan="2">6.0</td><td colspan="2">1.1</td></tr>
<tr><td>Total[2]</td><td>3.7</td><td>8.9</td><td>2.3</td><td>5.8</td><td>2.021</td><td>0.041</td><td>143.0</td><td>214.0</td><td>51.1</td><td>76.1</td></tr>
<tr><td>6 Airport-Related</td><td colspan="2">2.1</td><td colspan="2">1.7</td><td>0.382</td><td>0.008</td><td colspan="2">6.3</td><td colspan="2">1.0</td></tr>
<tr><td>Total[2]</td><td>4.7</td><td>9.9</td><td>3.4</td><td>6.9</td><td>2.215</td><td>0.040</td><td>143.3</td><td>214.3</td><td>51.0</td><td>76.0</td></tr>
<tr><td>7 Airport-Related</td><td colspan="2">2.5</td><td colspan="2">2.0</td><td>0.489</td><td>0.003</td><td colspan="2">17.8</td><td colspan="2">3.0</td></tr>
<tr><td>Total[2]</td><td>5.1</td><td>10.3</td><td>3.7</td><td>7.2</td><td>2.322</td><td>0.035</td><td>154.8</td><td>225.8</td><td>53.0</td><td>78.0</td></tr>
<tr><td>8 Airport-Related</td><td colspan="2">4.0</td><td colspan="2">3.5</td><td>0.540</td><td>0.045</td><td colspan="2">20.8</td><td colspan="2">3.7</td></tr>
<tr><td>Total[2]</td><td>6.6</td><td>11.8</td><td>5.2</td><td>8.7</td><td>2.373</td><td>0.077</td><td>157.8</td><td>228.8</td><td>53.7</td><td>78.7</td></tr>
<tr><td>9 Airport-Related</td><td colspan="2">4.7</td><td colspan="2">3.3</td><td>0.670</td><td>0.024</td><td colspan="2">13.0</td><td colspan="2">2.3</td></tr>
<tr><td>Total[2]</td><td>7.3</td><td>12.5</td><td>5.0</td><td>8.5</td><td>2.503</td><td>0.056</td><td>150.0</td><td>221.0</td><td>52.3</td><td>77.3</td></tr>
<tr><td>10 Airport-Related</td><td colspan="2">8.1</td><td colspan="2">4.0</td><td>1.355</td><td>0.044</td><td colspan="2">28.4</td><td colspan="2">5.3</td></tr>
<tr><td>Total[2]</td><td>10.7</td><td>15.9</td><td>5.7</td><td>9.2</td><td>3.188</td><td>0.076</td><td>165.4</td><td>236.4</td><td>55.3</td><td>80.3</td></tr>
</table>

[1] See Exhibit III-17 for receptor point locations.

[2] See Table B-1 in Appendix B for non-airport-related concentrations and ranges of concentrations.

[1] This value is a guideline for attainment of the ozone standard.

TABLE III-13
PROJECTED (1990) MAXIMUM POLLUTANT CONCENTRATIONS IN VICINITY OF WASHINGTON NATIONAL AIRPORT
(Controlled Growth Policy to 18 Million Passengers at National)

	CARBON MONOXIDE (ppm)				TOTAL HYDROCARBONS[3] (ppm)	NITROGEN DIOXIDE (ppm)	TOTAL SUSPENDED PARTICULATES (μg/m³)			
AVERAGING TIME	ONE-HOUR		EIGHT-HOUR		6-9 A.M. AVERAGE	ANNUAL AVERAGE	24-HOUR AVERAGE		ANNUAL GEOMETRIC MEAN	
FEDERAL AIR QUALITY STANDARD	35		9		0.24	0.05	260		75	
NON-AIRPORT RELATED CONCENTATIONS	2.6	7.8	1.7	5.2	1.833	0.032	137	208	50	75
RECEPTOR POINT[1]										
1 Airport-Related	3.8		2.9		0.707	0.047	26.2		4.8	
Total[2]	6.4	11.6	4.6	8.1	2.540	0.079	163.2	232.2	54.8	79.8
2 Airport-Related	0.7		0.5		0.106	0.009	3.7		0.7	
Total[2]	3.3	8.5	2.2	5.7	1.939	0.041	140.7	211.7	50.7	75.7
3 Airport-Related	0.9		0.8		0.163	0.007	3.2		0.6	
Total[2]	3.5	8.7	2.5	6.0	1.996	0.039	140.2	211.2	50.6	75.6
4 Airport-Related	0.8		0.4		0.152	0.008	5.2		0.9	
Total[2]	3.4	8.6	2.1	5.6	1.985	0.040	142.2	213.2	50.9	75.9
5 Airport-Related	1.0		0.5		0.170	0.009	5.4		1.0	
Total[2]	3.6	8.8	2.2	5.7	2.003	0.041	142.4	213.4	51.0	76.0
6 Airport-Related	1.8		1.4		0.344	0.007	5.5		0.9	
Total[2]	4.4	9.6	3.1	6.6	2.177	0.039	142.5	213.5	50.9	75.9
7 Airport-Related	2.3		1.8		0.449	0.003	15.9		2.7	
Total[2]	4.9	10.1	3.5	7.0	2.282	0.035	152.9	223.9	52.7	77.7
8 Airport-Related	3.4		3.0		0.485	0.039	18.3		3.2	
Total[2]	6.0	11.2	4.7	8.2	2.318	0.071	155.3	226.3	53.2	78.2
9 Airport-Related	4.0		2.8		0.595	0.021	11.5		2.0	
Total[2]	6.6	11.8	4.5	8.0	2.428	0.053	148.5	219.5	52.0	77.0
10 Airport-Related	7.0		3.5		1.211	0.039	25.5		4.7	
Total[2]	9.6	14.8	5.2	8.7	3.044	0.071	162.5	233.5	54.7	79.7

[1] See Exhibit III-17 for receptor point locations.

[2] See Table B-1 in Appendix B for non-airport-related concentrations and ranges of concentrations.

[3] This value is a guideline for attainment of the ozone standard.

TABLE III-14
PROJECTED (1990) MAXIMUM POLLUTANT CONCENTRATIONS IN VICINITY OF WASHINGTON NATIONAL AIRPORT
(Controlled Growth Policy to 16 Million Passengers at National)

	CARBON MONOXIDE (ppm)				TOTAL HYDROCARBONS [3] (ppm)	NITROGEN DIOXIDE (ppm)	TOTAL SUSPENDED PARTICULATES (µg/m³)			
AVERAGING TIME	ONE-HOUR		EIGHT-HOUR		6-9 A.M. AVERAGE	ANNUAL AVERAGE	24-HOUR AVERAGE		ANNUAL GEOMETRIC MEAN	
FEDERAL AIR QUALITY STANDARD	35		9		0.24	0.05	260		75	
NON-AIRPORT RELATED CONCENTATIONS	2.6	7.8	1.7	5.2	1.833	0.032	137	208	50	75
RECEPTOR POINT[1]										
1 Airport-Related	3.5		2.7		0.653	0.044	24.2		4.5	
Total[2]	6.1	11.3	4.4	7.9	2.486	0.076	161.2	232.2	54.5	79.5
2 Airport-Related	0.6		0.5		0.098	0.008	3.5		0.6	
Total[2]	3.2	8.4	2.2	5.7	1.931	0.040	140.5	211.5	50.6	75.6
3 Airport-Related	0.8		0.7		0.506	0.006	3.0		0.6	
Total[2]	3.4	8.6	2.4	5.9	2.339	0.038	140.0	211.0	50.6	75.6
4 Airport-Related	0.7		0.4		0.141	0.007	4.8		0.9	
Total[2]	3.3	8.5	2.1	5.6	1.974	0.039	141.8	212.8	50.9	75.9
5 Airport-Related	0.9		0.5		0.157	0.008	4.9		0.9	
Total[2]	3.5	8.7	2.2	5.7	1.990	0.040	141.9	212.9	50.9	75.9
6 Airport-Related	1.7		1.3		0.317	0.006	5.0		0.8	
Total[2]	4.3	9.5	3.0	6.5	2.150	0.038	142.0	213.0	50.8	75.8
7 Airport-Related	2.1		1.7		0.414	0.002	14.6		2.5	
Total[2]	4.7	9.9	3.4	6.9	2.247	0.034	151.6	222.8	52.5	77.5
8 Airport-Related	3.1		2.8		0.447	0.037	16.8		3.0	
Total[2]	5.7	10.9	4.5	8.0	2.280	0.069	153.8	224.8	53.0	78.0
9 Airport-Related	3.7		2.6		0.547	0.020	10.5		1.9	
Total[2]	6.3	11.5	4.3	7.8	2.380	0.052	147.5	218.5	51.9	76.9
10 Airport-Related	6.4		3.2		1.116	0.036	23.5		4.3	
Total[2]	9.0	14.2	4.9	8.4	2.949	0.068	160.5	231.5	54.3	79.3

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[1] See Exhibit III-17 for receptor point locations.

[2] See Table B-1 in Appendix B for non-airport-related concentrations and ranges of concentrations.

[3] This value is a guideline for attainment of the ozone standard.

TABLE III-15
PROJECTED (1990) MAXIMUM POLLUTANT CONCENTRATIONS IN VICINITY OF WASHINGTON NATIONAL AIRPORT
(Reduced Activity Policy at National)

	CARBON MONOXIDE (ppm)				TOTAL HYDROCARBONS^3(ppm)	NITROGEN DIOXIDE (ppm)	TOTAL SUSPENDED PARTICULATES (μg/m^3)			
AVERAGING TIME	ONE-HOUR		EIGHT-HOUR		6-9 A.M. AVERAGE	ANNUAL AVERAGE	24-HOUR AVERAGE		ANNUAL GEOMETRIC MEAN	
FEDERAL AIR QUALITY STANDARD	35		9		0.24	0.05	260		75	
NON-AIRPORT RELATED CONCENTATIONS	2.6	7.8	1.7	5.2	1.833	0.032	137	208	50	75
RECEPTOR POINT[1]										
1 Airport-Related	3.3		2.5		0.605	0.041	22.4		4.1	
Total[2]	5.9	11.1	4.2	7.7	2.438	0.073	159.4	230.4	54.1	79.1
2 Airport-Related	0.6		0.4		0.091	0.007	3.2		0.6	
Total[2]	3.2	8.4	2.1	5.6	1.924	0.039	140.2	211.2	50.6	75.6
3 Airport-Related	0.7		0.6		0.139	0.006	2.7		0.5	
Total[2]	3.3	8.5	2.3	5.8	1.972	0.038	139.7	210.7	50.5	75.5
4 Airport-Related	0.7		0.4		0.130	0.007	4.4		0.8	
Total[2]	3.3	8.5	2.1	5.6	1.963	0.039	141.4	212.4	50.8	75.8
5 Airport-Related	0.8		0.4		0.145	0.007	4.6		0.8	
Total[2]	3.4	8.6	2.1	5.6	1.978	0.039	141.6	212.6	50.8	75.8
6 Airport-Related	1.5		1.2		0.292	0.006	4.7		0.8	
Total[2]	4.1	9.3	2.9	6.4	2.125	0.038	141.7	212.7	50.8	75.8
7 Airport-Related	1.9		1.5		0.384	0.003	13.5		2.3	
Total[2]	4.5	9.7	3.2	6.7	2.217	0.035	150.5	221.5	52.3	77.3
8 Airport-Related	2.9		2.5		0.413	0.033	15.4		2.7	
Total[2]	5.5	10.7	4.2	7.7	2.246	0.065	152.4	223.4	52.7	77.7
9 Airport-Related	3.3		2.4		0.502	0.018	9.7		1.7	
Total[2]	5.9	11.1	4.1	7.6	2.335	0.050	146.7	217.7	51.7	76.7
10 Airport-Related	5.9		2.9		1.027	0.033	21.6		4.0	
Total[2]	8.5	13.7	4.6	8.1	2.860	0.065	158.6	229.6	54.0	79.0

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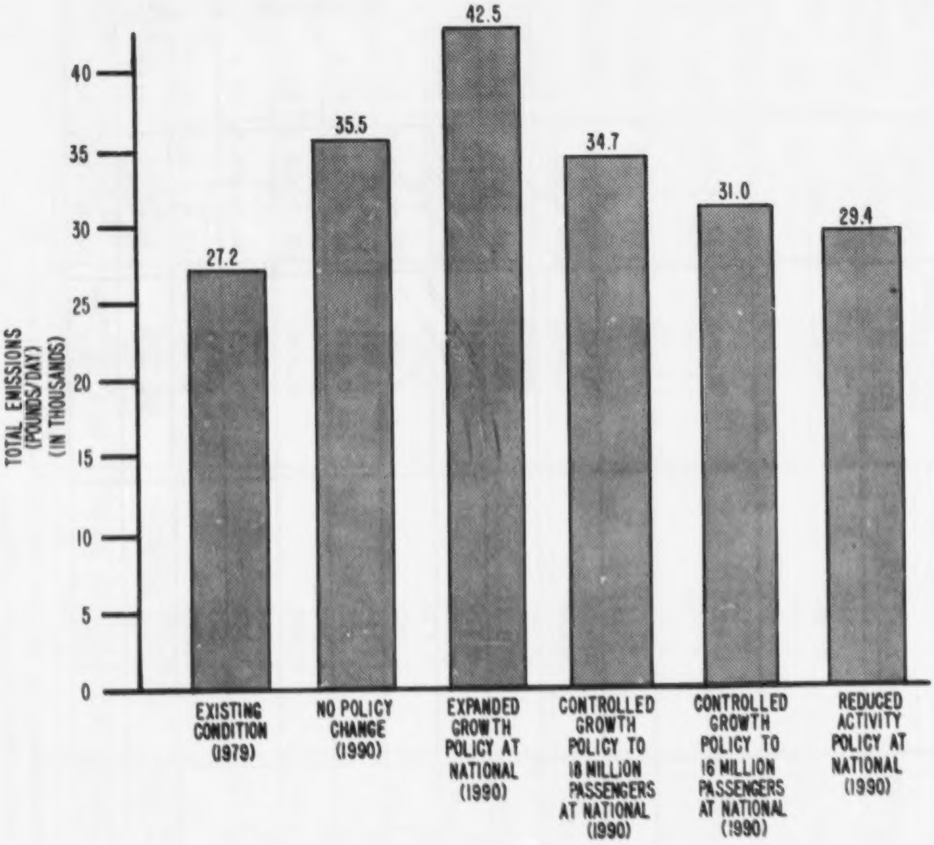
[1] See Exhibit III-17 for receptor point locations.

[2] See Table B-1 in Appendix B for non-airport-related concentrations and ranges of concentrations.

[3] This value is a guideline for attainment of the ozone standard.



METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

TOTAL DAILY AIRCRAFT POLLUTANT EMISSIONS AT NATIONAL

EXHIBIT III-18

In order to evaluate the regional effect of the alternatives, the pollutant totals for each alternative, presented in Tables III-10, III-30, and III-41, at each airport were totaled. The resultant pollutant loadings provide a regional overview for each of the proposed alternatives. By adding the total emissions at the airport for each alternative it can be seen under the Reduced Activity Policy at National, the emission totals at all three airports yields the largest total pollutant loading of any alternative. Exhibits III-18, III-41, and III-50 present the aircraft contribution singularly. Totaling the aircraft pollutant totals under each of the alternatives, provides an indication of aircraft contribution to the regional pollutant levels. The Reduced Activity Policy at National for aircraft only, also exhibits the largest emission loadings when considering the three airports as a whole.

The entire Air Quality Control Region has been designated as nonattainment for ozone, which is produced when reactive hydrocarbons and nitrogen oxides are exposed to sunlight. Table III-16 presents the hydrocarbon emissions for all three airports to provide a basis for discussion of the ozone regional impact. The Reduced Acitivity Policy at National yields the largest total, whereas, the No Policy Change at National results in the lowest emissions, and therefore, is more beneficial from an ozone standpoint. There is no single alternative which is significantly more beneficial from a regional standpoint than any other alternative.

As can be seen, there is no alternative which is clearly superior from an air quality standpoint. The Reduced Activity alternative reduces air pollutant concentrations in the immediate vicinity of National, whereas, the Expanded Growth Policy alternative results in the largest concentrations of pollutants in the National Airport vicinity. Conversely from a regional standpoint the reverse is true; the Expanded Growth alternative represents the lowest emission totals and the Reduced Activity the highest.

TABLE III-16

REGIONAL HYDROCARBON EMISSIONS[a]
(pounds per day)

Alternatives	National	Dulles	Baltimore-Washington	Regional Total
Existing (1979)	6,081	13,582	7,623	27,286
No Policy Change at National	7,264	11,373	6,690	25,327
Expanded Growth Policy at National	8,284	11,364	6,294	25,942
Controlled Growth Policy to 18 Million at National	6,806	12,005	7,019	25,830
Controlled Growth Policy to 16 Million at National	6,099	12,943	7,719	26,761
Reduced Activity Policy at National	5,585	14,116	8,134	27,835

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[a] Includes emissions from aircraft and airport-related traffic.

ENERGY

Introduction and Methodology

Energy consumption at the Washington area airports can vary for each of the alternative cases evaluated. Some energy considerations are case-independent and, as such, are not included in this subsection's evaluation. This would include, for example, energy consumption for aircraft in flight between the Washington-Baltimore area and other cities. Discussed in this section are the variations in fuel consumption which could result from two alternative related sources: surface traffic usage (increase of vehicle miles traveled), and air traffic delays. In addition to these considerations, the effect of aircraft mix on energy usage and the availability of surface mass transit is also discussed.

Surface Traffic Energy Consumption

For many of the alternative cases, some air passengers would be required to drive longer distances due to air carrier scheduling restrictions at National. These longer distances result in excess fuel consumption. To determine what this consumption will be, the vehicle miles traveled was calculated for each alternative. Based on an origin and destination survey of National passengers, trip lengths were assigned to various destinations. Assuming diverted passengers wish to go to the same destination, trip lengths in most instances are longer from Dulles or Baltimore-Washington. Exceptions, of course, which have been included in the analysis, involve vehicle trips from Dulles to certain northern Virginia destinations and from Baltimore-Washington to certain Maryland suburbs of Washington. Upon determining the total vehicle miles traveled, a fuel consumption rate (15 miles per gallon for 1980 and 24 miles per gallon for 1990) was multiplied providing a total airport-related surface vehicle fuel consumption.

Energy Consumption Due to Air Traffic Delay

Fuel consumption also results from delays due to air traffic congestion.

Aircraft experience delay in landing or departing when the nominal capacity of the airport is exceeded and their free movement is restricted by other aircraft also attempting to use the airfield or airspace surrounding the airport. When other aircraft request service, the movement time for a given aircraft may be extended beyond the nominal; that is, the aircraft may be delayed and put in a holding pattern by air traffic control. Also, a departing aircraft may be stopped at the runway threshold to permit an arriving aircraft to descend to that runway, roll, and exit the runway. As the demand increases, the delays experienced by individual aircraft using the system tend to increase at a fast rate. Procedures have been developed for estimating hourly, daily, and annual delay to aircraft.

The first step in calculating the delay for the three airports was to analyze the various hourly airfield capacities. The hourly capacity is defined as the number of aircraft operations (arrivals and departures) that can take place on the airfield in one hour. The number of aircraft operations on a runway system depends on a number of factors, including but not limited to the following:

* Ceiling and visibility;
* Runway use;
* Aircraft mix;
* Percent arrivals;
* Percent touch-and-go;
* Exit location and number of taxiways; and
* Other operating conditions.

Hourly capacities at Dulles and Baltimore-Washington airports were obtained from their respective Master Plans. Hourly capacity for National was computed using the different aircraft mixes for each alternative. In order to show the "worst case," IFR operations were assumed for each airport's hourly capacity.

For Baltimore-Washington and Dulles, the analysis indicated that sufficient IFR hourly capacity exists for the next 10-15 years. Therefore, the delay analysis focused on National.

The average delay by aircraft for peak hour IFR conditions was computed by determining a demand to capacity ratio for each alternative and using the procedures contained in the FAA report, Technical Report on Airport Capacity and Delay Studies. It should be noted that the delay times were computed by holding the demand constant at 60 operations per hour. Then, by determining the amount of delay that each aircraft would experience, the amount of fuel consumed in a taxiing/idle mode and in a holding pattern mode was calculated. The assumptions used in the analysis included the following:

* Half of the delay time occurred during the landing mode and half during taxi and idle time;
* Delay was assumed to occur by all types of aircraft in proportion to the percentage using each facility (that is, if 30 percent of the aircraft are B-727s, then 30 percent of the delay time would be assigned to B-727s); and
* Fuel consumption rates for the taxi/idle mode and the landing mode for each aircraft type were taken from a technical support report entitled Aircraft Emission Factors, prepared in March 1977, by the United States Environmental Protection Agency.

For Baltimore-Washington and Dulles, the delay attributed to the policy alternatives is less sensitive. This results from these two facilities having more available capacity than National to meet operational requirements.

Aircraft Mix and Energy Consumption

The amount of energy usage previously discussed focused on a small portion of an aircraft trip: the landing and takeoff modes at National. The effect of the policy alternatives on total energy usage throughout the aircraft's full trip is better measured by the flexibility which is available in choosing an aircraft which optimizes seat mile efficiency.

Air carrier jet aircraft in today's fleet range from the smaller B-737 and DC-9 aircraft to the 380-seat B-747. Exhibit III-19 illustrates the relative energy efficiency of various aircraft.

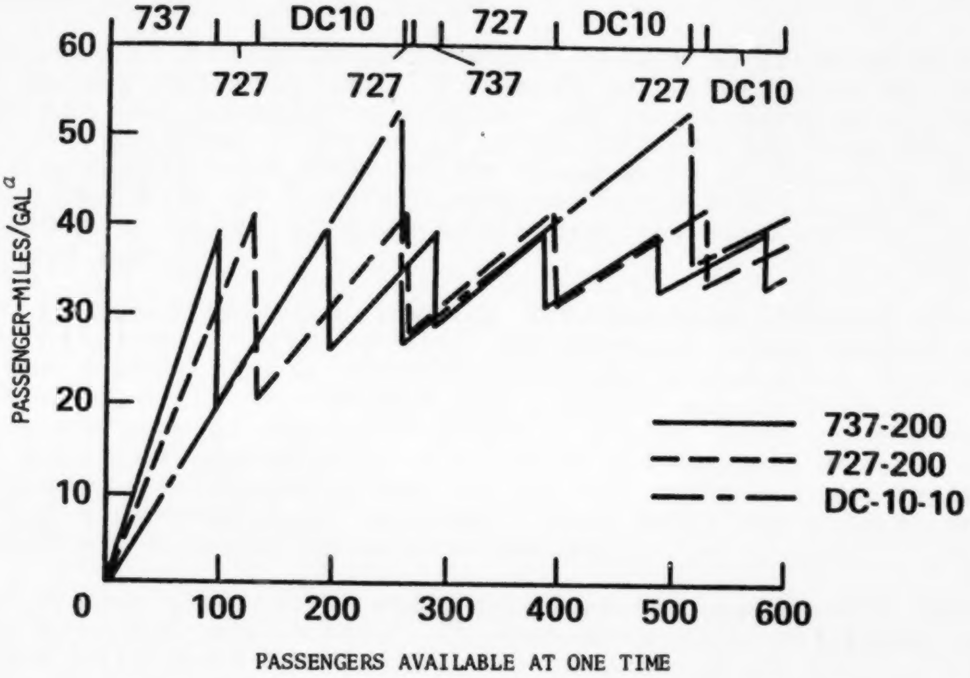
In order to maximize energy-efficiency, it is most important to provide a mix of aircraft of varying seat capacities. Passenger demand provides the basis for optimum aircraft usage. For example, if there are 220 persons desiring to travel from Washington to Boston, these persons could be accommodated with three B-737s, two B-727s or one DC-10. The most energy efficient usage in this case would be the DC-10. Other situations where a lesser number of persons typically desire service, another aircraft type would be most energy-efficient. The conclusion is that to be most energy-efficient, flexibility is needed to choose between types of aircraft to meet demand.

Existing Conditions

Direct energy consumption results predominantly from the power required to service the terminal building and airfield facilities and fuel for aircraft and related ground transportation operations. Recent energy consumption at National for electrical power has remained rather stationary over a three-year period with consumption of 38.4, 37.9, and 38.8 million kilowatts per year in fiscal years 1975, 1976, and 1977, respectively.

An analysis of current energy consumption resulting from aircraft delay was conducted as was surface traffic energy usage resulting from diversion of passengers from National to Dulles and to Baltimore-Washington. Results show that presently 3,800 gallons of fuel are consumed as a result of aircraft delay under peak hour conditions at National.

Energy-efficiency in terms of ground transportation is affected by opportunities for mass transit at the airport. At



Aircraft Energy Efficiency vs Available Passengers[b]

[a] 10 passenger-miles/gal = 13,500 Btu/passenger miles.

[b] Based on a stage length of 1150 statute miles and the following airplane performance characteristics

Aircraft	Seats available	Seat-miles/gal
737-200	97	38.8
727-200	132	41.6
DC 10-10	258	52.7

Source: L.J. Williams, NASA Ames Research Center, Air Transportation Energy Efficiency, presented at the Fourth National Conference on the "Effects of Energy Constraints on Transportation Systems", Union College, Aug. 1-5, 1977, Fig. 12.; taken from Transportation Energy Conservation Data Book: Edition 2.

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

AIRCRAFT ENERGY EFFICIENCY
VS AVAILABLE PASSENGERS

EXHIBIT III-19

National, limousine, bus, and the Metro system provide an opportunity for reducing fuel consumption. In addition, the internal airport access system was recently improved to provide for less-congested flow in the terminal area.

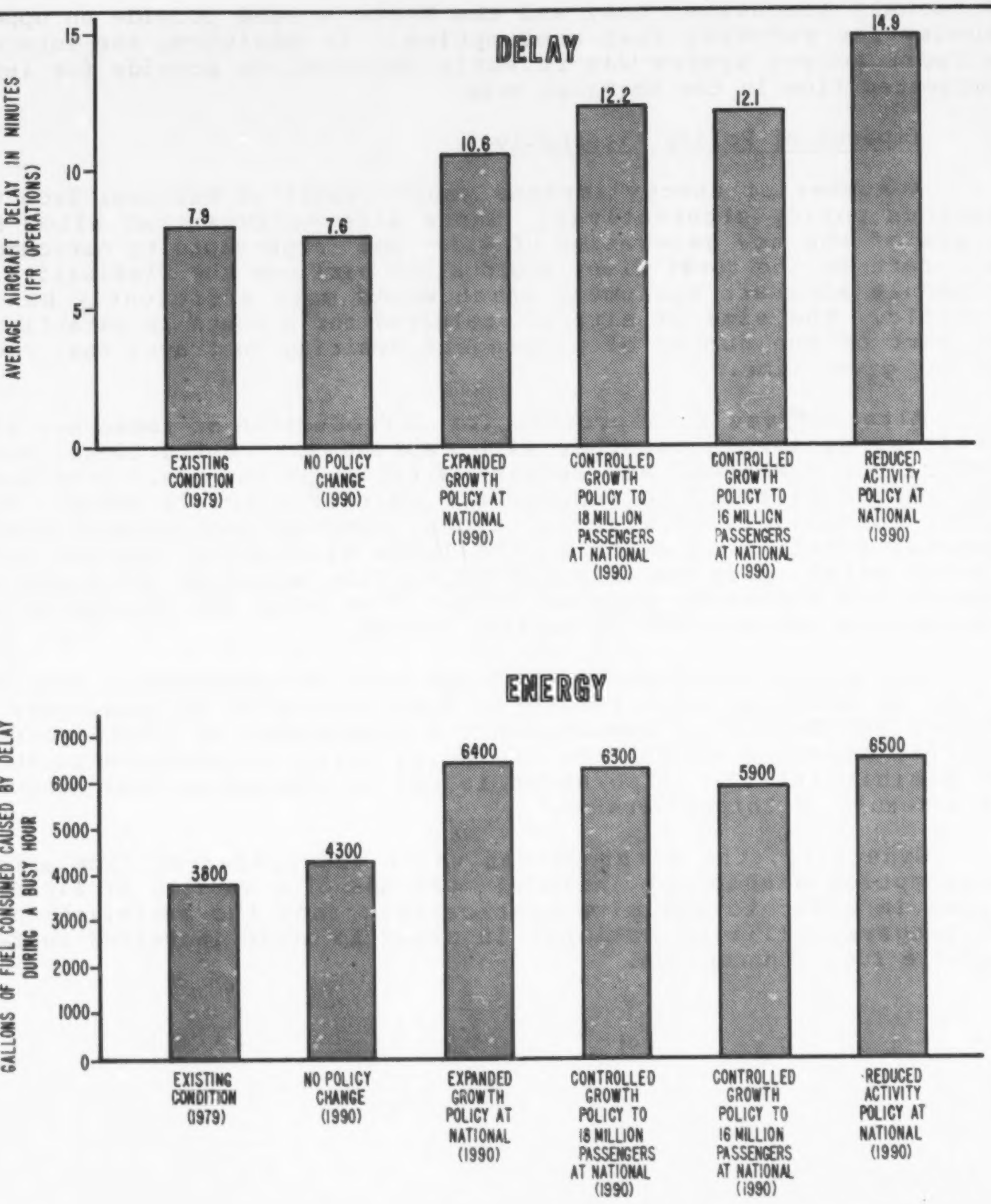
Impacts of Policy Alternatives

A number of energy impacts would result at National from the various policy alternatives. Those alternatives that allow for a mix of the new generation of wide- and large-capacity narrowbody aircraft in the total fleet would allow airlines the flexibility to schedule aircraft equipment which would most efficiently handle traffic. The size of aircraft selected for a route is established in part on the number of passengers desiring to travel that route at any given time.

Alternatives that provide for introduction of these new aircraft at National, together with enplanement restrictions, would reduce the number of air carrier aircraft in the mix. This would contribute directly to reduced air carrier aircraft delay. However, the variety of aircraft types, ranging from single-engine general aviation aircraft to the large widebodies, creates additional delay, particularly due to varying approach and departure speeds and wide-body wake vortices. This delay and related energy consumption are provided on Exhibit III-20.

Any policy alternative which provides for enplanement restrictions at National will result in some diversion of passengers to Dulles and Baltimore-Washington. A comparison of total surface traffic diverted within the region by policy alternative is shown on Exhibit III-21. Also shown is the corresponding fuel consumed as a result of this diversion.

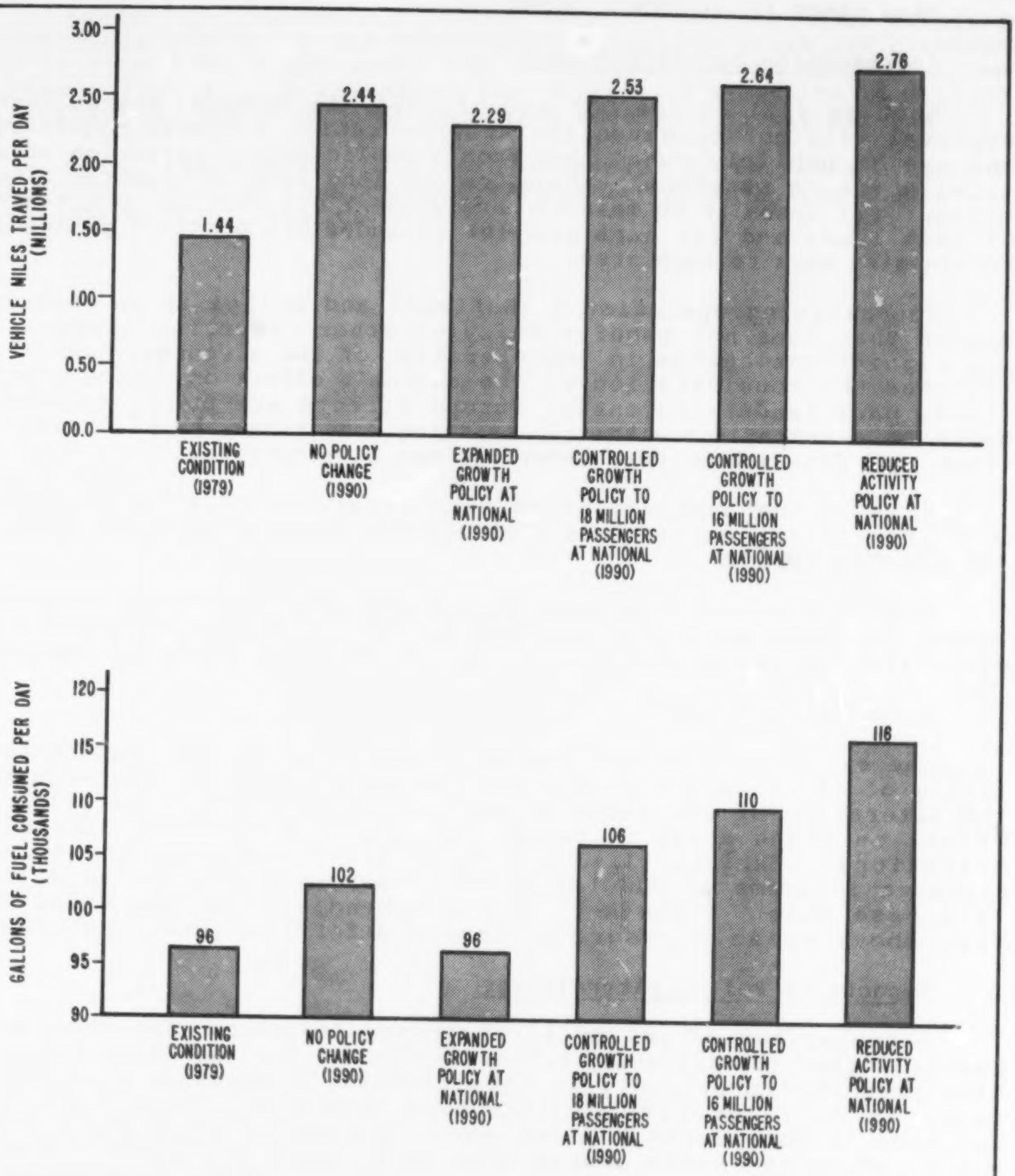
Generally, the alternatives which are preferred from a fuel consumption standpoint include: the use of a variety of aircraft types in order to maximize seat capacity and the maximization of passengers utilizing National in order to avoid increased surface vehicle fuel consumption.



METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

AIRCRAFT DELAY AND ENERGY CONSUMPTION BY ALTERNATIVE AT NATIONAL

EXHIBIT III-20



METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT
REGIONAL SURFACE TRAFFIC VEHICLE MILES TRAVELED AND RELATED FUEL CONSUMPTION

EXHIBIT III-21

PARK LANDS AND HISTORIC SITES

Introduction and Methodology

Section 4(f) of the DOT Act of 1966, as Amended, states that approval will not be given for transportation projects requiring the use of publicly owned land from a public park, recreation area or wildlife or waterfowl refuge, or any land from an historic site unless: (1) there is no feasible and prudent alternative to the use of such land, and (2) such project includes all possible planning to minimize harm to such areas.

The existing operation of National and Dulles is an ongoing action that does not require daily or other recurring approval. Any significant change in the operation of the airports, however, requires the consideration of the action's effect on, among other items, park lands. Potential future effects are to be evaluated based on a comparison with: (1) existing conditions, and (2) conditions in a future base year under various alternatives.

This is the approach taken with regard to park lands which were identified, mapped, and evaluated in terms of existing direct and off-site impacts.

Historic sites were also mapped and results of the various impact analyses were then applied to the sites in the respective vicinities of the airports in order to evaluate levels of impact.

Existing Conditions

The existing physical limits of National do not require the taking of any existing park or recreation area nor do they require the alteration of any lands of historic significance. The primary effect on these areas is noise exposure from existing aircraft operations. Exhibit III-3 and Table III-3 summarize the noise exposure in terms of cumulative daily exposure for the existing 1979 base case. Table A-1, in the Appendix, provides existing time above noise exposure information for the same locations.

Impacts of Policy Alternatives

A comparison of policy alternatives indicates that noise exposure varies significantly between options. See the Noise subsection presented previously in this report. A decision on whether there is 4(f) involvement cannot be determined until a policy decision is considered. In any event, any policy alternative that would reduce the noise exposure on park lands and historic sites would not be considered to require Section 4(f) involvement. Essentially, the action of reducing existing impacts will not be considered a taking of parklands. Three of the policy alternatives, Controlled Growth to 18 Million at National, Controlled Growth to 16 Million at National, and Reduced Activity at National, all result in reductions in noise exposure on park lands and historic sites.

Table III-3 shows a decrease in noise exposure over existing conditions (1979) at all parks and recreation areas and historic sites from 3 to 6 NEF under the Controlled Growth to 18 Million alternative, 4 to 6 NEF under the Controlled Growth to 16 Million alternative, and 8 to 9 NEF under the Reduced Activity alternative.

Noise exposure would remain unchanged or increase by 1 to 2 NEF over existing conditions (1979) under the No Policy Change and Expanded Growth alternatives.

SOCIAL AND ECONOMIC CONDITIONS

Introduction and Methodology

The operation of an airport has both primary and secondary socioeconomic effects on its influence area. The primary effects include employment levels in the airline and airline-related, concession, and government sectors that are sensitive to changes in passenger enplanements and concession revenues that are generated by passenger purchases. Concession payments and landing fees made to the airport operator, employee spending, employment in tourist-related enterprises, and local tax revenue changes that result from increased income in an area are the secondary impacts that result from airport operation. Both primary and secondary impacts are considered in this report.

A detailed discussion of the social and economic impacts of the alternatives is contained in a companion document to this FEIS entitled, "Economic Report/Urban and Community Impact Analysis." The reader is referred to this other document for further information.

Existing Conditions

Approximately 4,300 Washington area residents are currently employed full-time at National. With an average salary in 1979 of $21,450, the total payroll for full-time employees is $93,522,000. This total payroll is distributed throughout the area based largely on location of employee residences. The most recent survey of airport employees, completed in 1980, indicates that 62 percent of National's employees reside in Virginia, 20 percent in Maryland, 8 percent in the District of Columbia, and 10 percent in other areas. Thus, Virginia will benefit from the majority of spending by National employees.

An additional direct economic impact of National is the revenue generated by concessionaires from passenger purchases. Gross revenues in 1979 approximated $65 million, with a total payment to Metropolitan Washington Airports (MWA) of more than $13 million in fees and charges.

Landing fees received by MWA generate further expenditures in the area. The fee schedule is set so that payments equal the amount needed to maintain the airfield. The fees thus are divided to accommodate payroll changes as well as expenditures for supplies and services. In 1979, landing fees collected by MWA amounted to about $4.2 million.

Full-time employment, passenger expenditures, and landing fees at National contribute $162 million to the local economy. Based on the accepted economic axiom that each dollar spent is "recycled" to generate additional income, expenditures directly related to National contribute over $324 million to the Washington area economy each year.

Secondary impacts of the airport include among others employment at area hotels, motels, restaurants, travel agencies, and car rental agencies. Such enterprises are supported by tourists, businessmen, and visitors to the area. No current data is available to estimate the expenditures by Washington visitors who arrive by air. However, it is important to consider the contribution of the secondary employment from National. Thus, the economic impact of primary and secondary employment exceeds the $324 million attributed to primary employment.

Impacts of Policy Alternatives

Table III-17 shows the comparative economic impacts of the policy alternatives at National. Exhibit III-22 shows existing 1980 and projected 1990 employment at each airport under each alternative.

As evidenced by this information, all alternatives will result in increased employment, payroll, concession revenue and payment, and landing fees at National. The magnitude of these increases varies significantly with alternative. As most of the indices are based on passenger growth, the Expanded Growth Policy at National yields the greatest monetary impacts, and the Reduced Activity Policy at National is expected to yield the smallest contribution to the area in 1990.

It must be emphasized that it is not expected that there will be any permanent reduction in the present number of National employees under any of the alternative policies. The potential reduction in employee levels under the Reduced Activity Policy at National from 1980-1985 is expected to be reversed from 1985-1990 so that 1990 employee levels will be at about 1980 levels. Employment growth would be limited as a result of the proposed annual limits of 14, 16, and 18 million passengers in the Reduced Activity and Controlled Growth alternatives. The number of employees at National is expected to remain fairly stable once the passenger limit under these alternatives has been reached. Employee expenditures will also tend to remain relatively constant, especially in Arlington and Fairfax Counties.

Because of the high portion of minority employees at National, the limited employment growth there will likely affect employment opportunities for women and minorities more than nonminorities.

In general, a 1978 FAA report found that 31.6 percent of air carrier jobs were held by minorities and women.[1] The same report found that 70 percent of all employees of the tenants and concessionaires at National were minorities (including women).

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[1] U.S. Department of Transportation, Federal Aviation Administration, Review of Minority Participation on Airports Receiving Grant Assistance Under the Airport and Airway Development Act of 1970, July 1978, Appendix K, pp. 5-6.

TABLE III-17

COMPARATIVE ECONOMIC IMPACTS OF ALTERNATIVE POLICIES
WASHINGTON NATIONAL AIRPORT

	FULL-TIME EMPLOYMENT	EMPLOYEE PAYROLL[a]	CONCESSION REVENUE[a]	CONCESSION PAYMENT[a]	LANDING FEES[a]
Existing Conditions	4,360	$ 93.5	$ 65.1	$ 13.0	$ 4.2
No Policy Change	4,870	$104.4	$ 88.0	$ 17.6	$ 6.5
Expanded Growth Policy at National	5,100	$109.4	$ 98.5	$ 19.8	$ 8.0
Controlled Growth Policy to 18 Million Passengers at National	4,740	$101.7	$ 82.1	$ 16.5	$ 6.6
Controlled Growth Policy to 16 Million Passengers at National	4,570	$ 98.0	$ 74.5	$ 15.0	$ 5.9
Reduced Activity Policy at National	4,400	$ 94.4	$ 66.8	$ 13.4	$ 5.4

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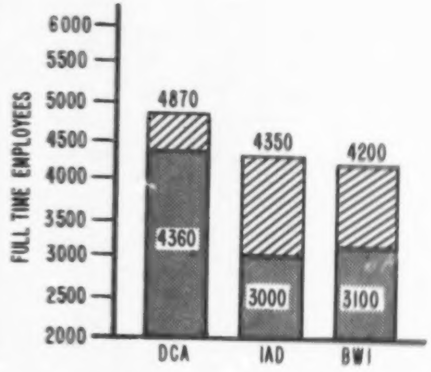
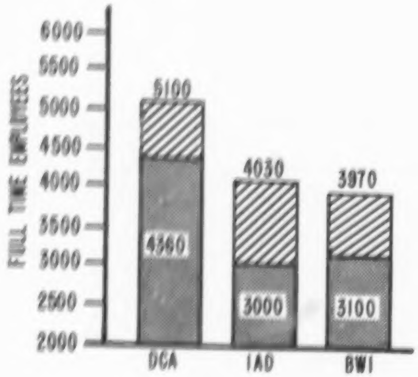
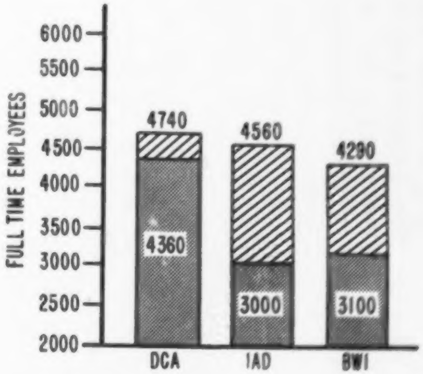
[a] In millions of 1980 dollars.



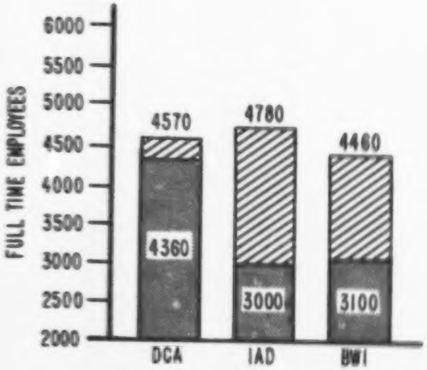
NO POLICY CHANGE (1990)



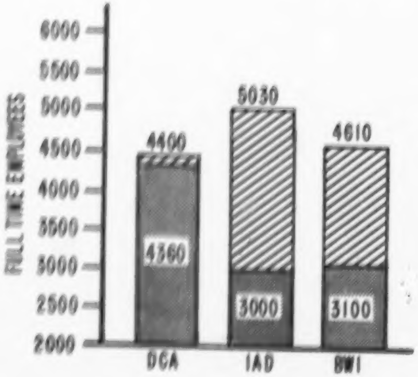
EXPANDED GROWTH POLICY
AT NATIONAL (1990)



CONTROLLED GROWTH POLICY
TO 18 MILLION PASSENGERS AT
AT NATIONAL (1990)



CONTROLLED GROWTH POLICY
TO 16 MILLION PASSENGERS AT
AT NATIONAL (1990)



REDUCED ACTIVITY POLICY
AT NATIONAL (1990)

DCA WASHINGTON NATIONAL
IAD DULLES INTERNATIONAL
BWI BALTIMORE WASHINGTON
▨ 1990
▩ 1980 EXISTING CONDITIONS

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

EXISTING AND 1990 AIRPORT EMPLOYMENT

EXHIBIT III-22

About 32 percent of the employees of MWA are members of minority groups (including women).[1] Travel-related industries (hotels/motels and restaurants) have also employed high proportions (50.2 percent) of minority and women workers.[2] Thus, any increase in air travel at National is expected to affect both direct and indirect airport employment of minorities.

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[1] U.S. Department of Transportation, Federal Aviation Administration, Review of Minority Participation on Airports Receiving Grant Assistance Under the Airport and Airway Development Act of 1970, July 1978, Appendix K, pp. 5-6.

[2] U.S. Equal Employment Opportunity Commission. Equal Employment Opportunity Report 1975: Job Patterns for Minorities and Women in Private Industry, Volume I. U.S. Government Printing Office, pp. 111, 125.

AIRLINE SERVICE

Introduction and Methodology

"Quality of Service" generally refers to the frequency, type of equipment, and number of intermediate stops used in providing air transportation service to a city-pair market. This section examines the four policy elements (perimeter, slot allocation, curfew, and aircraft size) which could affect the quality of service afforded Washington/Baltimore passengers.

There are several variables which influence the quality of air service between any two cities in a competitive market. They are:

- Demand for travel between the two cities;
- Distance between the cities;
- Availability of equipment compatible with servicing this demand over a given distance;
- The desire of an airline to serve the city-pair market;
- Airline regulation; and
- Airport operational restrictions.

In the case of the Washington-Baltimore region, air traffic is influenced by two types of government regulation.

The first is through the Civil Aeronautics Board's (CAB) nation-wide rules for the airline industry. The CAB is the Federal agency responsible for authorizing an airline to provide service to a city-pair market. Airlines are not permitted to serve new routes (or to drop out of existing routes) at will. The complete abandonment of service to cities is prohibited by the CAB if a carrier is the sole supplier of service to community a unless a suitable substitute is found.

Airline deregulation was begun in 1978 to encourage the industry to become more competitive for the benefit of the general public. It has also created a climate which encourages some airlines to use their available equipment in long-haul/high-density markets, which tend to be more profitable than short-haul markets. In many cases, there is a tendency for the airlines to discontinue service to smaller communities and to use as much of their available equipment as they can on their long-haul routes.

As it is difficult to foretell the actions of individual airlines under a given set of market conditions, this discussion is intended to express the collective trends to be anticipated by air carrier and commuter operators.

The second regulation on air service in the region is local in nature and consists of the FAA's operating policy for National Airport. To reiterate, the specific elements of this policy which affect service to the region are:

- The nonstop sevice perimeter;
- The limitation on the scheduling hours for commercial jet aircraft;
- The 60 slot-per-hour high density rule; and
- The limitation on the size of aircraft.

These policy elements act together to regulate service at National. They also indirectly influence activity at Dulles and Baltimore-Washington.

Changes to specific elements under any policy alternative must be assessed in the context of a "package" of elements contained in the alternative.

Existing Conditions

In preparation for the forecast of future conditions, an analysis was made of the historical combined air carrier and commuter nonstop quality of service index (QSI)[1] at each of the three airports and for the region as a whole. This analysis was made for the cities served by the airports grouped in the following mileage bands as measured from National: 0-150 miles; 151-200 miles; 201-300 miles (broken down into New York/Newark and "other"); 301-400 miles; 401-650 miles; 651-1000 miles (broken down into "grandfather" cities and "other"); 1001-1500 miles; and over

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[1] The Quality of Service Index is a mathematical measure used by CAB to describe service at a city. In this measuring system, large aircraft receive a higher rating than do small aircraft. Also, nonstop flights receive a higher rating than do flights with intermediate stops. The evaluation used here is concerned only with nonstop flights. For reference, see the Appendix in the Economic Report/Urban and Community Impact Analysis for a summary of the QSI used for various equipment.

1500 miles. Only domestic destinations were studied. Table III-18 shows historical one-way nonstop QSI values by mileage band on an average weekday in April for 1973, 1976, 1979, and 1980. Table III-19 shows percent of total one-way nonstop QSI by mileage band.

It is quite evident that National has by far the greatest share of the regional QSI. This is in large measure due to its location being nearer to the concentration of persons using the region's airports.[1]

Table III-18 shows the effects of the recent recession. The 1980 QSI value in the vast majority of mileage bands has dropped from that in 1979. The most important aspect of this table is that it shows the dramatic drop in activity at Dulles, where the total QSI dropped over 35 percent compared to drops of 9 percent and 10 percent, respectively, at National and Baltimore-Washington.

Table III-19 shows that the tendency at all three airports (and for the region) has been toward a slight reduction in service for the middle-distance mileage bands (151-400 miles) with corresponding increases to cities closer than 150 miles and further than 400 miles from the region. This table shows percent changes in QSI values.

Tables III-20 and III-21 show one-way, nonstop air carrier and commuter flights at each airport and for the region for these same years. Table III-22 shows origin/destination traffic by mileage band. When one analyzes passengers and QSI by mileage band, it becomes evident that some bands receive better quality of service than is warranted by their passenger statistics. This is shown in Table III-23.

Nonstop Perimeter

The present operating policy at National allows nonstop service to and from all cities within a 650-statute mile radius of the airport, and to the seven "grandfather" cities which had nonstop service on the date the perimeter arrangement was established in 1966. This action was, in part, intended to differentiate the roles of National and Dulles as the short/medium-haul and long-haul airports, respectively, for the Washington area. It was expected

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[1] The 1974 Washington-Baltimore Air Passenger Survey conducted for the State of Maryland, the Commonwealth of Virginia, and the Metropolitan Washington Council of Governements indicated that nearly 78 percent of the persons using all three airports stated their local origin or destination as either Washington, D.C. or the Maryland or Virginia suburbs of Washington.

TABLE III-18

ONE-WAY NONSTOP QUALITY OF SERVICE PER DAY[a]
BY AIRPORT AND THE REGION

Mileage Band	NATIONAL				DULLES				BALTIMORE-WASHINGTON				REGIONAL TOTALS			
	1973	1976	1979	1980	1973	1976	1979	1980	1973	1976	1979	1980	1973	1976	1979	1980
0-150	28.97	28.68	22.50	26.41	7.69	9.04	9.46	4.51	12.97	12.08	19.14	18.80	49.63	49.80	51.10	49.72
151-200	18.65	21.84	21.92	14.17	0	0	0.40	0	4.83	5.46	7.24	5.24	23.48	27.30	29.56	19.41
Cumulative	47.62	50.52	44.42	40.58	7.69	9.04	9.86	4.51	17.80	17.54	26.38	20.04	73.11	77.10	80.66	69.13
201-300																
New York/Newark	36.50	32.60	37.16	29.78	16.24	21.38	19.22	9.68	12.91	6.93	8.88	8.64	65.65	60.91	65.26	48.10
Others	27.07	29.55	31.05	32.01	1.26	1.62	0.91	0.85	4.12	2.32	4.56	1.14	32.45	33.49	36.52	34.00
Sub-total	63.57	62.15	68.21	61.79	17.50	23.00	20.13	10.53	17.03	9.25	13.44	9.78	98.10	94.40	101.78	82.10
Cumulative	111.19	112.67	112.63	102.37	25.19	32.04	29.99	15.04	34.83	26.79	39.82	33.82	171.21	171.50	182.44	151.23
301-400	41.82	37.25	50.95	38.04	7.00	0	1.78	0	4.35	8.06	7.68	4.34	53.17	45.31	60.41	42.38
Cumulative	153.01	149.92	163.58	140.41	32.19	32.04	31.77	15.04	39.18	34.85	47.50	38.16	224.38	216.81	242.85	193.61
401-650	83.48	82.24	92.02	83.80	7.75	6.56	9.10	5.69	25.48	29.45	27.64	25.94	116.71	118.25	128.76	115.43
Cumulative	236.49	232.16	255.60	224.21	39.94	38.60	40.87	20.73	64.66	64.30	75.14	64.10	341.09	335.06	371.61	309.04
651-1000																
Grandfather	31.34	30.90	42.12	45.68	0	0	0	0	3.56	3.78	4.34	6.90	34.90	34.68	46.46	52.58
Other	0	0	0	0	4.56	2.00	2.00	3.00	6.34	3.78	8.00	5.78	10.90	5.78	10.00	8.78
Sub-total	31.34	30.90	42.12	45.68	4.56	2.00	2.00	3.00	9.90	7.56	12.34	12.68	45.80	40.46	56.46	61.36
Cumulative	267.83	263.06	297.72	269.89	44.50	40.60	42.87	23.73	74.56	71.86	87.48	76.78	386.89	375.52	428.07	370.40
1001-1500	0	0	0	0	16.00	16.50	17.00	17.00	4.00	4.00	8.12	8.42	20.00	20.50	25.12	25.42
Cumulative	267.83	263.06	297.72	269.89	60.50	57.10	59.87	40.73	78.56	75.86	95.60	85.20	406.89	396.02	453.19	395.82
1501+	0	0	0	0	17.85	17.00	28.50	16.50	5.00	5.00	1.00	1.50	22.85	22.00	29.50	18.00
Total	267.83	263.06	297.72	269.89	78.35	74.10	88.37	57.23	83.56	80.86	96.60	86.70	429.74	418.02	482.69	413.82

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[a] Domestic traffic only. Includes air carriers and commuters. For average weekday in April for years indicated.

Source: Reuben O. Donnelly Company, Official Airline Guide, April 1, 1973, 1976, 1979, 1980. 1979 and 1980 data obtained through I. P. Sharp Associates. 1973 and 1976 figures are for flights to the region, while 1979 and 1980 figures are for flights from the region.

TABLE III-19

PERCENT OF ONE-WAY NONSTOP QUALITY OF SERVICE[a]
BY AIRPORT AND THE REGION

Mileage Band	NATIONAL				DULLES				BALTIMORE-WASHINGTON				REGIONAL TOTALS			
	1973	1976	1979	1980	1973	1976	1979	1980	1973	1976	1979	1980	1973	1976	1979	1980
0-150	10.82	10.90	7.58	9.79	9.81	12.20	10.70	7.88	15.52	14.94	19.81	21.68	11.55	11.91	10.59	12.01
151-200	6.96	8.30	7.36	5.25	0	0	0.45	0	5.70	6.75	7.49	6.04	5.46	6.53	6.12	4.69
Cumulative	17.78	19.20	14.92	15.04	9.81	12.20	11.16	7.88	21.30	21.69	27.31	23.11	17.01	18.44	16.71	16.70
201-300																
New York/Newark	13.63	12.39	12.48	11.03	20.73	28.85	21.75	16.91	15.45	8.57	9.19	9.97	15.28	14.57	13.52	11.62
Others	10.11	11.23	10.43	11.86	1.61	2.19	1.03	1.49	4.93	2.87	4.72	1.31	7.55	8.01	7.57	8.22
Sub-total	23.74	23.63	22.91	22.89	22.34	31.04	22.78	18.40	20.38	11.44	13.91	11.28	22.83	22.58	21.09	19.84
Cumulative	41.52	42.83	37.83	37.93	32.15	43.24	33.94	26.28	41.68	33.13	41.22	39.00	39.84	41.03	37.80	36.54
301-400	15.61	14.16	17.11	14.09	8.93	0	2.01	0	5.21	9.97	7.95	5.01	12.37	10.84	12.52	10.24
Cumulative	57.13	56.99	54.94	52.02	41.08	43.24	35.95	26.28	46.89	43.10	49.17	44.01	52.21	51.87	50.31	46.79
401-650	31.17	31.26	30.91	31.05	9.89	8.85	10.30	9 94	30.49	36.42	28.61	29.92	27.16	28.29	26.68	27.89
Cumulative	88.30	88.24	85.85	83.07	50.98	52.09	46.25	36.22	77.38	79.52	77.78	73.93	79.37	80.15	76.99	74.68
651-1000																
GF	11.70	11.75	14.15	16.93	0	0	0	0	4.26	4.67	4.49	7.96	8.12	8.30	9.63	12.71
Other	0	0	0	0	5.82	2.70	2.26	5.24	7.59	4.67	8.28	6.67	2.54	1.38	2.07	2.12
Sub-total	11.70	0	0	0	5.82	2.70	2.26	5.24	11.85	9.35	12.77	14.63	10.66	9.68	11.70	14.83
Cumulative	100.00	100.00	100.00	100.00	56.80	54.79	48.51	41.46	89.23	88.87	90.56	88.56	90.03	89.83	88.68	89.51
1001-1500	0	0	0	0	20.42	22.27	19.24	29.70	4.79	4.95	8.41	9.71	4.65	4.90	5.20	6.14
Cumulative	100.00	100.00	100.00	100.00	77.22	77.06	67.75	71.17	94.02	93.82	98.96	98.27	94.68	94.74	93.89	95.65
1501+	0	0	0	0	22.78	22.94	32.25	28.83	5.98	6.18	1.04	1.73	5.32	5.26	6.11	4.35
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

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[a] Domestic traffic only. Includes air carrier and commuters for average weekday in April for years indicated.

Source: Table III-18.

TABLE III-20

DOMESTIC AIR CARRIER DEPARTURES PER DAY[a]
BY AIRPORT AND THE REGION

Mileage Band	NATIONAL				DULLES				BALTIMORE-WASHINGTON				REGIONAL TOTALS			
	1973	1976	1979	1980	1973	1976	1979	1980	1973	1976	1979	1980	1973	1976	1979	1980
0-150	27	35	20	17	7	12	8	2	11	5	14	11	45	52	42	30
151-200	17	23	22	15	0	0	0	0	5	1	9	8	22	24	31	23
Cumulative	44	58	42	32	7	12	8	2	16	6	23	19	67	76	73	53
201-300																
New York/Newark	41	37	43	30	18	19	21	10	14	7	9	9	73	63	73	49
Others	31	29	36	31	1	3	0	0	7	4	5	1	39	36	41	32
Sub-total	72	66	79	61	19	22	21	10	21	11	14	10	112	99	114	81
Cumulative	116	124	121	93	26	34	29	12	37	17	37	29	179	175	187	134
301-400	35	38	56	41	5	0	2	0	3	7	9	7	43	45	67	48
Cumulative	151	162	177	134	31	34	31	12	40	24	46	36	222	220	254	182
401-650	92	84	94	86	5	7	8	5	23	31	30	28	120	122	132	119
Cumulative	243	246	271	220	36	41	39	17	63	55	76	64	342	342	386	301
651-1000																
Grandfather Cities	33	34	44	52	0	0	1	0	4	2	5	6	37	36	50	58
Other	0	0	0	0	4	2	4	3	7	4	8	6	11	6	12	9
Sub-total	33	34	44	52	4	2	5	3	11	6	13	12	48	42	62	67
Cumulative	276	280	315	272	40	43	44	20	74	61	89	76	390	384	448	368
1001-1500	0	0	0	0	16	16	17	17	4	4	9	9	20	20	26	26
Cumulative	276	280	315	272	56	59	61	37	78	65	98	85	410	404	474	394
1501+	0	0	0	0	16	15	24	12	5	2	3	1	21	17	27	13
Total	276	280	315	272	72	74	85	49	83	67	101	86	431	421	501	407

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[a] Average weekday in April for years indicated.

Source: Reuben O. Donnelly Company, Official Airline Guide, April 1, 1973, 1976, 1979, 1980. 1979 and 1980 data obtained through I. P. Sharp Associates.

TABLE III-21

COMMUTER DEPARTURES PER DAY[a]
BY AIRPORT AND THE REGION

Mileage Band	NATIONAL				DULLES				BALTIMORE-WASHINGTON				REGIONAL TOTALS			
	1973	1976	1979	1980	1973	1976	1979	1980	1973	1976	1979	1980	1973	1976	1979	1980
0-150	33	35	50	61	11	12	8	10	16	50	51	57	60	97	109	128
151-200	7	3	12	6	0	3	2	0	3	6	0	0	10	12	14	6
Cumulative	40	38	62	67	11	15	10	10	19	56	51	57	70	109	123	134
201-300																
New York/Newark	0	0	0	0	1	0	1	2	1	3	1	6	2	3	2	8
Others	18	11	6	13	0	3	7	5	2	1	2	2	20	15	15	20
Sub-total	18	11	6	13	1	3	8	7	3	4	3	8	22	18	17	28
Cumulative	58	49	68	80	12	18	18	17	22	60	54	65	92	127	140	162
301-400	2	6	2	0	0	0	0	0	3	1	0	0	5	7	2	0
Cumulative	60	55	70	80	12	18	18	17	25	61	54	65	97	134	142	162
401-650	0	2	0	0	1	0	0	0	3	3	0	0	4	5	0	0
Cumulative	60	57	70	80	13	18	18	17	28	64	54	65	101	139	142	162
651-1000																
Grandfather Cities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3
Sub-total	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3
Cumulative	60	57	70	80	13	18	18	20	28	64	54	65	101	139	142	165
1001-1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cumulative	60	57	70	80	13	18	18	20	28	64	54	65	101	139	142	165
1500+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	60	57	70	80	13	18	18	20	28	64	54	65	101	139	142	165

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[a] Average weekday in April for years indicated.

Source: Reuben O. Donnelly Company, *Official Airline Guide*, April 1, 1973, 1976, 1979, 1980. 1970 and 1980 data obtained through I. P. Sharp Associates.

TABLE III-22
1978 ORIGIN/DESTINATION PASSENGERS
BY AIRPORT AND THE REGION
(in thousands)

Mileage Band	NATIONAL				DULLES				BALTIMORE-WASHINGTON				REGIONAL TOTALS			
	Air Carrier	Commuter[a]	Total	Percent of Total	Air Carrier	Commuter[a]	Total	Percent of Total	Air Carrier	Commuter[a]	Total	Percent of Total	Air Carrier	Commuter[a]	Total	Percent of Total
0-150	148	487	635	6.81	43	1	44	1.64	71	204	275	9.47	262	692	954	6.40
151-200	268	39	307	3.29	14	2	16	0.60	90	9	99	3.41	372	50	422	2.83
Cumulative	416	526	942	10.10	57	4	61	2.28	161	213	374	12.87	634	742	1376	9.23
201-300																
New York/Newark	1334	3	1337	14.33	646	0	646	24.10	207	0	207	7.12	2187	3	2190	14.68
Others	708	43	751	8.05	10	11	11	0.78	111	4	115	3.96	829	58	887	5.95
Sub-total	2042	46	2088	22.38	656	21	667	24.88	318	4	322	11.08	3016	61	3077	20.63
Cumulative	2458	572	3030	32.48	713	15	728	27.15	478	217	695	23.92	3650	803	4453	29.86
301-400	1175	17	1192	12.78	21	0	21	0.78	235	*	235	8.09	1431	17	1448	9.71
Cumulative	3633	589	4222	45.26	734	15	749	27.94	713	218	931	32.05	5081	820	5901	39.56
401-650	2385	0	2385	25.57	212	0	212	7.91	761	*	761	26.20	3358	0	3358	22.51
Cumulative	6019	589	6607	70.82	947	15	961	35.84	1414	218	1692	58.24	8439	820	9259	62.07
651-1000																
Grandfather Cities	1028	0	1028	11.02	14	0	14	0.52	303	0	303	10.43	1345	0	1345	9.02
Others	648	0	648	6.95	181	0	181	6.75	301	0	301	10.36	1130	0	1130	7.38
Subtotal	1676	0	1676	17.97	195	0	195	7.27	603	0	603	20.76	2475	0	2475	16.59
Cumulative	7695	589	8283	88.79	1142	15	1156	43.12	2077	218	2295	79.00	10914	820	11734	78.67
1001-1500	515	0	515	5.52	438	0	438	16.34	229	0	229	7.88	1182	0	1182	7.92
Cumulative	8210	589	8798	94.31	1580	15	1594	59.46	2306	218	2524	86.88	12096	820	12916	86.60
1501+	531	0	531	5.69	1087	0	1087	40.54	381	0	381	13.12	1999	0	1999	13.40
Total	8741	589	9329	100.00	2667	15	2681	100.00	2687	218	2905	100.00	14095	820	14915	100.00

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[a] 1979 data.

*Less than 500 passengers

Source: CAB 10% sample of air carrier passengers for 1978; 1979 commuter carrier passenger statistics as reported to the CAB.

TABLE III-23

COMPARISON OF PERCENTAGES OF OPERATIONS AND PASSENGERS BY AIRPORT AND THE REGION

	NATIONAL*		DULLES*		BALTIMORE-WASHINGTON*		REGIONAL TOTALS*	
Mileage Band	Percent of Operations 1979	Percent of Passengers 1978	Percent of Operations 1979	Percent of Passengers 1978	Percent of Operations 1979	Percent of Passengers 1978	Percent of Operations 1979	Percent of Passengers 1978
0-150	7.58	6.81	10.70	1.64	19.81	9.47	10.59	6.40
151-200	7.36	3.29	0.45	0.60	7.49	3.41	6.12	2.83
Cumulative	14.92	10.10	11.16	2.28	27.31	12.87	16.71	9.23
201-300								
New York/Newark	12.48	14.33	21.75	24.10	9.19	7.12	13.52	14.68
Others	10.43	8.05	1.03	0.78	4.72	3.96	7.57	5.95
Subtotal	22.91	22.38	22.78	24.88	13.91	11.08	21.09	20.63
Cumulative	37.83	32.48	33.94	27.15	41.22	23.95	37.80	29.86
301-400	17.11	12.78	2.01	0.78	7.95	8.09	12.52	9.71
Cumulative	54.94	45.26	35.95	27.94	49.17	32.05	50.31	39.56
401-650	30.91	25.57	10.30	7.91	28.61	26.20	26.68	22.51
Cumulative	85.85	70.82	46.25	35.84	77.78	58.24	76.99	62.07
651-1000								
Grandfather Cities	14.15	11.02	0	0.52	4.49	10.43	9.63	9.02
Other	0	6.75	2.26	6.75	8.28	10.36	2.07	7.58
Subtotal	14.15	17.97	2.26	7.27	12.77	20.76	11.70	16.59
Cumulative	100.00	88.79	48.51	43.12	90.56	79.00	88.68	78.67
1001-1500	0	5.52	19.24	16.34	8.41	7.88	5.20	7.92
Cumulative	100.00	94.31	67.75	59.46	98.96	86.88	93.89	86.60
1501+	0	5.67	32.25	40.54	1.04	13.12	6.11	13.40
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

*Note that figures may not add internally due to rounding.
SOURCES: Tables III-19 and III-22.

that prohibition of nonstop long-haul flights at National would serve to promote use of Dulles. This was logical in that Dulles' larger acreage, longer runways, newer facilities, and considerably lower population density in surrounding areas were, and are, much more conducive to future development of aviation there than at National. Market conditions have, however, tended to cause an opposite reaction on the parts of the airlines and air passengers who prefer National to Dulles. Exhibit III-23 shows the existing perimeter, the "grandfather" cities, and some of the larger cities outside the present perimeter.

The efficiency and effectiveness of maintaining this perimeter is now being questioned by some, since it is costly to the airlines who derive higher revenues from long-haul flights than from multi-stop flights, and since it excludes some cities from potential non-stop National service. It is important to note, however, that many of these cities which are outside the perimeter presently receive nonstop service to Dulles and/or Baltimore-Washington. Essentially, access into the Washington-Baltimore region occurs through one or more of its three major airports.

Scheduling Hours and Curfew

Dulles has historically been unrestricted and open for continuous 24-hour service. No policy proposal would change this operating arrangement for Dulles. National, on the other hand, has been operating since the introduction of air carrier turbojets in 1966 under voluntary arrangements with airport users to insure that the late night hours remain relatively free of jet operations. These voluntary arrangements include an agreement with the airlines not to schedule jet aircraft after 10 p.m. and before 7 a.m., and a request to general aviation jet operators not to operate after 11 p.m. and before 7 a.m. Propeller aircraft are free to operate at any time from National.

The effect of these voluntary restrictions has resulted in relatively little activity at National during the late night hours. On an average weekday, there are 1,031 daily operations at National.[1] Over the 24-hour day, approximately 95 percent of all operations occur between the hours of 7 a.m. and 10:30 p.m., with the remaining 5 percent of operations occurring after 10.30 p.m. and before 7 a.m. This activity consists mainly of a smaller number of propeller aircraft operations and occasional air carrier jets that have been delayed because of weather or mechanical reasons.

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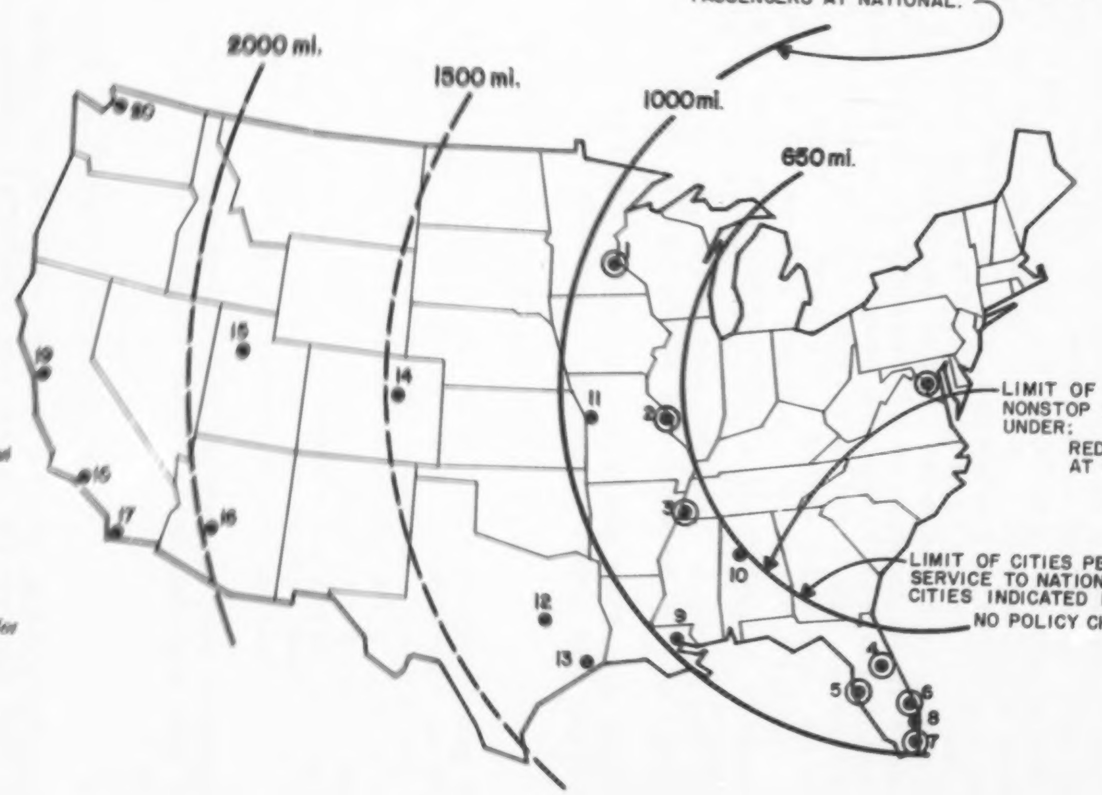
[1] Air carrier and commuter component were obtained from Official Airline Guide, per August 30, 1979. General aviation component was obtained through airport records.

LIMIT OF CITIES PERMITTED NONSTOP SERVICE TO NATIONAL UNDER:
EXPANDED GROWTH POLICY AT NATIONAL, CONTROLLED GROWTH POLICY TO 18 MILLION PASSENGERS AT NATIONAL, AND CONTROLLED GROWTH POLICY TO 16 MILLION PASSENGERS AT NATIONAL.



LIMIT OF CITIES PERMITTED NONSTOP SERVICE TO NATIONAL UNDER:
REDUCED ACTIVITY POLICY AT NATIONAL.

LIMIT OF CITIES PERMITTED NONSTOP SERVICE TO NATIONAL, INCLUDING CITIES INDICATED BY: ◉ UNDER:
NO POLICY CHANGE ALTERNATIVE.

Grandfather Cities:
1. Minneapolis/St. Paul
2. St. Louis
3. Memphis
4. Orlando
5. Tampa
6. West Palm Beach
7. Miami

Additional Cities Eligible for Non-Stop Service with 1,000 Mile Perimeter:
8. Ft. Lauderdale
9. New Orleans
10. Birmingham
11. Kansas City

Cities Outside Perimeter Options:
12. Dallas/ Ft. Worth
13. Houston
14. Denver
15. Salt Lake City
16. Phoenix
17. San Diego
18. Los Angeles
19. San Francisco
20. Seattle

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

CITIES AFFECTED UNDER VARIOUS PERIMETER OPTIONS AT NATIONAL

EXHIBIT III-23

These voluntary arrangements, while keeping the late night hours relatively free of intrusive jet operations in a statistical sense, have nevertheless resulted in some annoying late night activity and in confusion and misunderstanding on the part of local citizens.

Under the FAA's High Density Rule, the airlines may schedule up to 40 operations per hour (plus extra sections) over the operating day, including 40 operations in the 10 p.m. hour. Under the terms of the voluntary scheduling arrangement, the airlines schedule no activity after 10 p.m. However, the combination of the High Density Rule and the voluntary scheduling arrangement has created a one-minute period exactly at 10 p.m. that has been treated as a scheduling hour. Because of this situation, up to 40 operations could theoretically be scheduled at this minute. Typically, over 20 such flights are currently scheduled at 10 p.m. In addition, almost 40 air carrier flights are scheduled in the 9 p.m. to 9:59 p.m. hour. This is a total of almost 60 scheduled operations over a 61 minute period. On most nights, it takes until 10:30 p.m., and sometimes later, to complete this concentration of scheduled turbojet activity at National. As a result, many local citizens mistakenly view the 10 p.m. scheduling cutoff as an absolute operating curfew which FAA chooses not to enforce.

Exhibit III-24 shows the existing 1979 and 1990 day-night distribution of operations at National under the policy alternatives.

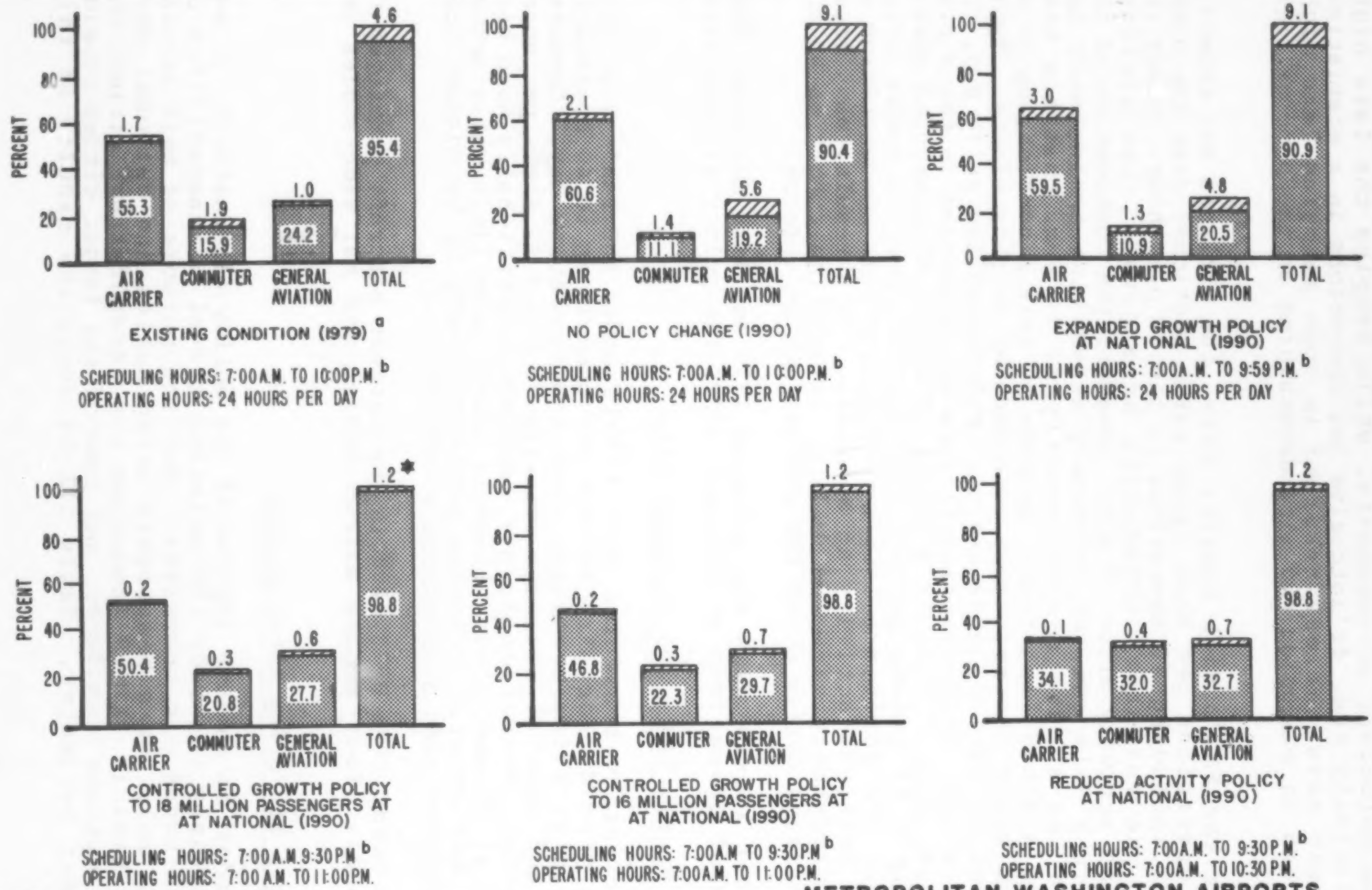
Hourly Slots and Aircraft Size

The existing scheduled slot levels under the FAA's High Density Rule provide for air carriers to schedule up to 40 operations per hour (plus extra sections) over the operating day. Commuter airlines and general aviation are allowed 8 and 12 slots per hour, respectively. At National, air carriers traditionally have been operating at or near their allowable hourly slot limit while actual commuter and general aviation activity tends to be higher than their respective slot allocations would indicate.

At present, the B-727-200 is the largest aircraft permitted to use National. Four-engine narrow-bodies and all wide-bodies are excluded.

Impacts of Policy Alternatives

In order to analyze impacts of the policy alternatives, it was first necessary to study the existing travel characteristics of Washington-bound air travelers. For the purpose of this initial analysis, only those passengers using Dulles and National were studied. Exhibit III-23 indicated the "grandfather" cities, the perimeter options considered, and some of the larger cities outside the present perimeter. Table III-24 shows the results of this



▨ NIGHT (10:01 P.M. TO 6:59 A.M.)

▩ DAY (7:00 A.M. TO 10:00 P.M.)

a BASED ON AIRPORT RECORDS MARCH AND APRIL, 1979

* MAY NOT ADD ACROSS DUE TO ROUNDING

b-SEE TABLE II 2 FOR COMPLETE DEFINITION OF SCHEDULING HOURS AND OPERATING HOURS.

METROPOLITAN WASHINGTON AIRPORTS

FINAL ENVIRONMENTAL IMPACT STATEMENT

PROJECTED DISTRIBUTION OF OPERATIONS BY AVIATION CLASS AT NATIONAL

EXHIBIT III-24

TABLE III-24

PASSENGER ALLOCATION TO
STUDY CITIES RECEIVING
DIRECT SERVICE WITH NATIONAL AND
NONSTOP SERVICE WITH DULLES

		FROM NATIONAL					FROM DULLES				
		Daily Direct Flights[b] Stops					Daily Direct Flights[b] Stops				
City	1978 Passengers From Washington[a]	0	1	2+	% of Passengers[c]	Number of Passengers	0	1	2+	% of Passengers[c]	Number of Passengers
Los Angeles	221,740	0	0	3	20%	44,348	9	0	3	80%	177,392
San Francisco	170,920	0	1	7	40%	68,368	5	2	0	60%	102,522
Dallas/ Ft. Worth	107,210	0	13	1	50%	53,605	5	0	2	50%	53,605
Denver	93,720	0	3	2	30%	28,116	7	1	0	70%	65,604
San Diego	57,670	0	0	2	30%	17,301	2	2	0	70%	40,369
Phoenix	41,480	0	0	2	25%	10,370	2	1	0	75%	31,110
Houston	72,320	0	6	1	30%	21,696	4	0	0	70%	50,624
Chicago[d]	275,690	23	9	1	95%	261,906	1	0	0	05%	13,784
Salt Lake City	25,220	0	2	0	50%	12,610	1	0	0	50%	12,610
Kansas City	51,290	0	5	0	55%	28,210	2	0	0	45%	23,080
Tulsa	19,580	0	0	1	10%	1,958	1	0	0	90%	17,662
Atlanta[d]	166,840	17	3	1	80%	133,472	4	1	0	20%	33,368
New Orleans	54,470	0	3	0	60%	32,682	1	0	1	40%	21,788
Austin	20,900	0	1	0	25%	5,225	1	2	0	75%	15,675
TOTAL	1,379,060	40	46	21	52.2%	719,867	45	9	6	47.8%	659,193

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[a] Based on CAB 10% survey.

[b] Official Airline Guide, August 30, 1979.

[c] Greiner Engineering Sciences, Inc., estimate.

[d] Cities within 650 statute-mile perimeter.

best copy available

analysis for some of the key cities studied. Detailed discussion of the analysis procedure and results can be found in the Economic Report/Urban and Community Impact Analysis.

The route characteristics through various "gateway" cities, or cities through which significant amounts of traffic are funneled to National, and the existing passenger split between Dulles and National became the basis of comparison for future conditions under each policy alternative.

No Policy Change

Nonstop Perimeter

This alternative would continue the current perimeter of 650-statute miles with the seven "grandfather" cities. Slot allocations would remain the same as at present, which would cause a small net increase in total operations per day due to increases in passenger demand. Levels of service to all cities presently receiving nonstop service to National would most likely remain similar to that at present and new cities within the perimeter could possibly be served if they demonstrated sufficient market demand, although if the present trend continues, the tendency would be for the "grandfather" cities and the large hub cities of Atlanta, and Chicago to pick up more service at the expense of cities in the middle mileage bands.

Scheduling Hours and Curfew

As this policy alternative would maintain the status quo at National, no curfew would be imposed at the airport and activity would continue in a manner similar to that practiced at present.

Hourly Slots and Aircraft Size

Under the No Policy Change alternative, by 1990, there could be an increase of approximately 40 air carrier operations per day at National over that which is experienced at present. This would primarily be due to the airlines utilizing more of their available hourly slots. Since the percentage increase in operations is much smaller than the corresponding increase in anticipated air carrier passengers, more large aircraft (B-727-200s) would have to be used than are used under existing conditons. On the average, more passengers would board each aircraft.

The increase of 40 daily operations (or approximately two operations per hour) would have a high tendency to be destined for one of the cities already receiving high levels of service from the airport. In general, more communities should receive service from larger aircraft, B-727s as opposed to DC-9s.

This alternative would not allow aircraft larger than the B-727-200 to use National.[1]

Expanded Growth Policy at National

Nonstop Perimeter

This alternative calls for establishing a perimeter of 1,000-statute miles. New Orleans, Fort Lauderdale, Kansas City, and Birmingham are the cities that would most likely receive new nonstop service. The 1,000-mile perimeter would tend to draw flights away from Baltimore-Washington and Dulles. Cities outside the new 1,000-mile perimeter would continue to have nonstop flights to Baltimore-Washington and Dulles, but may get increased frequencies of one-stops to National through the new cities receiving nonstop service to National. A more complete discussion of the 1,000 mile perimeter is contained under the Controlled Growth Policy to 18 Million Passengers at National, below.

Scheduling Hours and Curfew

The Expanded Growth alternative would also maintain the airport's present operating practice. This alternative would, however, eliminate the 10:00 p.m. scheduling "hour," discussed earlier, by a rollback to 9:59 p.m.

Hourly Slots and Aircraft Size

Under this alternative, between 36 and 44 scheduled air carrier operations per hour would be permitted at National from 7:00 a.m. until 8:59 p.m. and 40 per hour from 9:00 p.m. until 9:59 p.m. on weekdays, with fewer slots allowed on weekends. The additional hourly operations would be taken from the presently allowed general aviation slot limit in order to maintain a scheduling maximum of 60 available slots in any hour. This policy would also eliminate the availability of scheduling operations in the minute 10:00 p.m. till 10:01 p.m. which exists at present.

This proposal would reduce the number of slots permitted on weekends. It should be noted, however, that less activity presently occurs during weekend hours as compared to weekday hours. Essentially, this proposal would add to some weekday hourly totals and reduce slots from weekend totals. However, the weekend slots that are reduced have never been utilized. Therefore, no actual reduction in operations would occur.

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[1] The introduction of any aircraft of a higher passenger capacity than the B-727-200, such as the narrow-bodied and still uncertificated DC-9-80 and B-757, would have to be handled under a policy proposal and thus would not occur under the No Policy Change alternative.

The introduction of new-generation higher capacity aircraft would accompany the "increase" in hourly weekday slots at the airport. This would indicate that fewer aircraft would be needed to move the same number of passengers to any given city. It is likely that the airlines would decide to use the wide-bodied aircraft on the high-density routes and narrow-bodied aircraft on other routes. Depending on market conditions, this added seating capacity could also indicate that air carriers may choose to initiate service to smaller communities which presently do not receive air carrier service.

The impacts of this alternative on general aviation at first appear to be significant - a 49 percent decrease in allowable slots. In practice, however, since the 60 slots per hour high-density rule applies to IFR operations, general aviation operations which often operate under VFR flight rules should not be significantly affected except during IFR conditions. Allowable commuter operations at the airport would be increased by 50 percent from 8 to 12 operations per hour.

Controlled Growth Policy to 18 Million Passengers at National

Nonstop Perimeter

The area opened to nonstop service to National under this alternative was indicated on Exhibit III-23. In this area, there are four cities which would be likely to benefit from the 1000-mile nonstop perimeter: Fort Lauderdale, New Orleans, Birmingham, and Kansas City - all communities with metropolitan area populations in excess of 800,000 persons.[1] In 1978, these four cities had a combined two-way traffic demand to the Washington-Baltimore region of approximately 500,000 passengers.[2]

A 1,000-mile perimeter for National would most likely result in an initial loss of 4 out of 86 nonstop flights per day at Dulles (a 5 percent reduction).[3] It is expected that this loss of flights would be temporary, lasting only until service could again be built up at Dulles.

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[1] Sales and Marketing Management, July 23, 1979.

[2] Derived from 1978 CAB 10 percent sample.

[3] Based on airline schedules for July 6, 1980.

This policy alternative could also contribute to a potential loss of nonstop air carrier service from National to cities within 650 miles of Washington which generate low-density traffic to the region. This would occur primarily because of the limited number of slots available to air carriers at National under this policy option. It is assumed for this analysis that the scheduling committees would continue to allocate air carrier slots among users. However, an alternative method of allocating slots could theoretically cause different air service patterns from what is described in this analysis. This policy effort does not consider such alternatives to the scheduling committees. The short-haul flights lost at National would likely be transferred to Baltimore-Washington because of the better frequency of connecting flights there than at Dulles. Thus, a 1,000-mile perimeter will reinforce Baltimore-Washington's market in short-haul flights. Alternately, certain cities could pick up commuter service from National if the air carriers were to cease to serve these markets.

Scheduling Hours and Curfew

This policy proposal would eliminate much of the confusion and misunderstanding concerning the scheduling and operating of air carrier aircraft and would not be discriminatory in the treatment of various categories of aircraft activity at National. Operating hours would be from 7:00 a.m. until 10:30 p.m. for all arrivals and departures with arrivals only permitted until 11:00 p.m. The airport curfew would be from 11:01 p.m. until 6:59 a.m. It also calls for a rollback in scheduling hours to 9:30 p.m. The curfew and the rollback of scheduling hours to 9:30 p.m. would be the most immediate and noticeable noise reduction benefit of the policy proposal. It would afford local citizens a predictable period of calm each night.

Finally, the one and one-half hour period between the 9:30 p.m. scheduling cutoff and the 11:00 p.m. curfew should, in all but the most unusual circumstances, provide sufficient time for the airlines to conclude scheduled operations. The current practice of concentrating flights at the end of the day by scheduling almost 40 air carrier flights from 9 p.m. until 9:59 p.m. and 20 flights at the 10 p.m. minute (a total of 60 flights in 61 minutes) requires on most nights only until 10:30 p.m. or slightly later to conclude operations.

In the same 61-minute time frame, under this alternative, the air carriers could schedule only 18 flights.

Hourly Slots and Aircraft Size

This policy alternative calls for maintenance of the maximum total of 60 slots per hour high-density rule at National. It requires, however, an initial rollback in the maximum allowable air carrier slots from 40 to 36 per hour with the 4 remaining slots going to commuters. In addition, the policy calls for further hourly air carrier slot reductions to maintain a ceiling of 18,000,000 annual passengers at the airport.

The primary result of this rollback in air carrier slots at National would be corresponding increases in the number of air carrier operations and passengers at Dulles and Baltimore-Washington. The proportion or share of this "diversion" of passengers and operations to Dulles and Baltimore-Washington would be based on a variety of factors including present levels of service to each of the two airports and distance from each airport to the local origin/destination of the majority of passengers. It was estimated that Dulles would receive approximately 60 percent of the diverted passengers and Baltimore-Washington would receive 40 percent.

As air carrier slots are reduced to meet the set passenger limit, there would also be a potential for loss of nonstop air carrier service to smaller communities within the 650-mile perimeter, specifically those cities whose 1990 origin/destination traffic to Washington is estimated to be less than approximately 30,000[1] annual two-way passengers. In a competitive market, cities with high traffic demand are more likely to receive service than cities with low demand. These impacts would also be affected by other variables, such as airline route structures. These smaller cities would not, however, be likely to completely lose service since commuter service to National would very likely be substituted. In fact, the present policy of airline deregulation is intended to encourage such activity, as no air carrier which provides sole service to a community is permitted to discontinue that service until a suitable replacement carrier is found.

This policy also would allow the new-generation of two- and three-engine aircraft to serve National. This would have beneficial effects in several areas: it would compliment the slot reduction in that fewer operations each hour would be required to move the same number of passengers presently carried by narrow-bodied aircraft and it would allow the airlines greater flexibility in scheduling their equipment. Also, the new-generation aircraft are, in general, much quieter and more fuel efficient than the jets now serving the airport. Airlines would most likely tend to use these larger aircraft on their highest density routes. It is not expected that the use of wide bodied aircraft would require significant alterations to the airfield. Under this alternative, it is estimated that by 1990 the airlines would be utilizing approximately 31 slots per hour.

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[1] Greiner Engineering Sciences, Inc. estimate based on existing traffic and demand characteristics. It should be noted that this figure is highly dependent on airline routing schedules so it could vary greatly from the number quoted in this report.

Controlled Growth Policy to 16 Million Passengers at National

Nonstop Perimeter

The effects on levels of service from National would be similar to those discussed under the policy alternative immediately above. New Orleans, Birmingham, Fort Lauderdale, and Kansas City would be expected to receive new nonstop service. Because of the lower passenger ceiling, however, there would be fewer slots available per day and this would tend to encourage the air carriers to further reduce the number of cities, within 650 miles of the region, served nonstop from National.

Scheduling Hours and Curfew

This policy proposal contains the same provisions identified immediately above under the Controlled Growth to 18 Million alternative and would thus produce like results.

Hourly Slots and Aircraft Size

The effects of this would be, in essence, identical to those described under the Controlled Growth to 18 Million alternative. The only difference is that still further air carrier slot reductions would probably be required to maintain the 16 million annual passenger ceiling at the airport. The triggering mechanism to ensure compliance with the passenger ceilings would be enacted at the appropriate times. It is anticipated that by 1990 the airlines would be utilizing approximately 28 slots per hour.

Reduced Activity Policy at National

Nonstop Perimeter

The Reduced Activity alternative calls for elimination of nonstop service to the "grandfather" cities. This, coupled with the substantial reduction in available air carrier slots would tend to funnel traffic through Chicago and Atlanta. In addition, Jacksonville, as well as Atlanta, would likely become primary stopping points for flights to and from Florida. Jacksonville would become the only city in the state with nonstop service to National. Atlanta would serve the southern section of the country, picking up the flights currently stopping at Memphis, while Chicago would likely receive the flights presently stopping in St. Louis and Minneapolis/St. Paul.

There could also be an increase in the number of flights between distant points and Dulles and Baltimore-Washington. Smaller communities within the 650-mile perimeter would likely experience a reduction in nonstop air carrier service to National due primarily to the slot cutbacks imposed by the alternative. It is anticipated, however, that commuter carriers would pick up some of this service because of the increase in hourly commuter slots.

Scheduling Hours and Curfew

Under this policy alternative the airport would be closed from 10:31 p.m. until 7:00 a.m. to all traffic except emergencies.

Under the Reduced activity proposal, with the slot rollback to 20 air carrier flights per hour and the scheduling rollback to 9:30 p.m., the airlines could only schedule 20 flights from 8 p.m. until 8:59 p.m. and 10 flights from 9:00 p.m. until 9:30 p.m. or 30 flights in 91 minutes. These figures compare to the current practice of 60 flights over 61 minutes. Given the record of the airlines in concluding scheduled operations under the current scheduling and operating arrangement, these policies which reduce concentration of scheduled flights at the end of the day and provide a one-hour period to conclude scheduled operations should not present significant problems for the airlines.

Hourly Slots and Aircraft Size

Under this alternative, the high-density rule of 60 operations per hour would remain in effect. The slot levels would, however, be significantly changed: air carriers would be permitted only 20 scheduled operations per hour. Extra sections would be included in the 20 slot per hour limit or eliminated. Commuter carrier slots and general aviation slots would increase accordingly. The slot reallocation would be accompanied by the imposition of a ceiling of 14,000,000 annual passengers at the airport. This action would result in considerable reductions in frequency of air carrier service to some communities. Uses of the new-generation of two- and three-engine aircraft would, however, be pemitted under this alternative. The likely result would be that the air carriers would tend to utilize a very high percentage of these new aircraft on their highest density routes. It is very likely that many communities could lose nonstop air carrier service to National. Some communities which presently have no direct service to National could receive commuter service as the commuters expanded their operations to make use of the increased number of slots and of the reduction in the presence of the air carriers.

General aviation would also benefit from this action, but since they operate above their slot limits now (95 percent of the time) the increase in general aviation slots would really mean very little except for IFR operations.

It would be anticipated that reductions in the number of operations permitted at National would cause corresponding increases in operations to Dulles and Baltimore-Washington. As in the two Controlled Growth alternatives, it would be expected that Dulles would receive approximately 60 percent of the traffic diverted away from National and Baltimore-Washington would receive 40 percent.

There would be some significant short-term impacts of this alternative at all three airports. The slot reduction would be accomplished rapidly, starting in 1981 with the immediate elimination of all extra sections, a rollback in scheduling hours from 10:00 p.m. to 9:30 p.m. and a drop in hourly air carrier schedules from 40 to 36. Every year for the next four years, four more hourly air carrier slots would be eliminated. Meanwhile, beginning in 1981, two- and three-engine wide-bodies would be permitted.

Since only a limited number of the new generation, high passenger capacity aircraft will be available during the first several years of the policy, the introduction of these aircraft will be gradual. The impacts of this will be that lift capacity (number of available seats in the air carrier fleet at National) will fall behind demand, especially as slots are reduced to 20 per hour. It is predicted, for example, that in 1985 total passengers using the airport will be approximately 12,661,000. By 1990, with the addition of these new generation aircraft to the fleet, and with gradually increasing boarding load factors at the airport, it is expected that 14,000,000 passengers could be reached.

There are significant differences between the Reduced Activity alternative and the Controlled Growth alternatives. The Reduced activity would reduce air carrier slots by more than 50 percent over 4 years while the Controlled Growth alternatives would maintain a passenger ceiling at National with gradual slot reductions over 10 years. The short-term impacts on service dislocations would be substantial. The following cities would definitely lose nonstop service immediately into National under this Reduced Activity alternative: Minneapolis, Miami, West Palm Beach, Tampa, Memphis, Orlando, and St. Louis. The following cities would either lose all nonstop service at National or would have a significant reduction in nonstop service within three years: Milwaukee, Huntsville, Indianapolis, Louisville, Knoxville, Lexington, Cincinnati, Detroit, Toledo, Dayton, Myrtle Beach, Providence, Charlotte, Columbus (Ohio), Hartford, Cleveland, Albany (N.Y.), Syracuse, Buffalo, Rochester, Fayetteville, Jacksonville (N.C.), Charleston (W. Va.), Greensboro, Islip, White Plains, Kingston (N.C.), Rocky Mount, Scranton, Roanoke, Norfolk, Staunton, Richmond, and Charlottsville. Service to many of these cities could eventually be established at Dulles or Baltimore-Washington or by way of another airport with connecting service into National. However, the rate of change and dislocation of service over the short-term would be significant. The service between these cities and National Airport is linked into the route structures of the individual airlines. If a link is broken or separated, it should not be assumed that this service can be automatically moved to another airport. In other words, many of the service patterns into National interrelate with one and another. When service is cut, it may be a period of time before it can be fully recovered at another airport.

It is necessary to stress that the Reduced Activity alternative cuts slots so rapidly as compared to the Controlled Growth alternatives that seat capacity cannot keep up with the cuts. This alternative would reduce air carrier slots from 640 per day to 290 per day in four years. The Controlled Growth alternatives, on the other hand give enough time for higher capacity new-generation aircraft to make-up for lost seat capacity over a longer period of time, 10+ years as compared to 4 years. In addition, slots are not reduced under the Controlled Growth alternatives as quickly, or as far, as compared to the Reduced Activity alternative. The net result is that service loss or dislocation under the Controlled Growth alternative is not as extreme as under Reduced Activity.

These lift capacity constraints at National will impact Dulles and Baltimore-Washington, over the short-term, as accelerated increases in traffic will be realized at both airports.

Comparison of Impacts

Table III-25 shows projected changes in one-way nonstop quality of service for air carriers and commuters by mileage band under each alternative as compared to existing conditions. This table can be compared to Table III-18, which was presented earlier in this discussion. It is important to note that Table III-25 should be used to understand relative differences in levels of service which would be expected to result from the policy alternatives. In addition, the policy alternatives are presented in the 1990 time period. The significant impacts of the Reduced Activity alternative during the mid-1980s are not shown. These service impacts are mitigated somewhat by 1990 because of seat capacity increasing with widebody and larger capacity aircraft.

TABLE III-25

COMPARISON OF IMPACTS OF POLICY ALTERNATIVES ON ONE-WAY NONSTOP QUALITY OF SERVICE AT NATIONAL FOR CITIES IN THE MILEAGE BANDS SHOWN

Mileage Band	1980 Existing Conditions	1990 No Policy Change	1990 Expanded Growth Policy at National	1990 Controlled Growth Policy to 18 Million Passengers at National	1990 Controlled Growth Policy to 16 Million Passengers at National	1990 Reduced Activity Policy at National
0-200	40.58	52	50	43	40	43
201-300						
New York/ Newark	29.78	38	39	31	29	30
Other Cities	32.01	41	42	34	29	21
Sub-Total	61.79	79	81	65	58	51
301-400	38.04	47	46	35	30	25
401-650	83.80	107	109	88	77	83
651-1000						
Grandfather Cities	45.68	58	59	48	43	0
Other Cities	0.0	0	6	5	4	0
Sub-Total	45.68	58	65	53	47	0
1001+	0.0	0	0	0	0	0
TOTAL	269.89	343	351	284	252	202

NATURAL SYSTEMS

The ongoing operation of and the modification of the policy for the Washington airports are actions of a non-construction nature whose direct impacts on adjacent natural systems are minimal. Though construction may occur in the future as an indirect result of the selected policy, the majority of the airports' lands are "man-dominated," that is, the lands have been converted to airport use or are periodically maintained. In any event, any future proposed construction at National would be subject to an additional environmental review that would include consideration of future effects on adjacent natural systems.

DULLES INTERNATIONAL AIRPORT

NOISE

Introduction and Methodology

The following presents the existing noise conditions at Dulles and compares these to the impacts likely to result from the alternative policy changes at National. The noise analysis methodology is the same as that described previously for National.

Assumptions

For purposes of this study, the following overall conditions have been assumed at Dulles:

* Approaches are assumed to follow the centerline of flight corridors shown on Exhibit III-25, descending along a 3 degree glide slope;

* Aircraft departure tracks are also shown on Exhibit III-25 and use standard profiles as stored in the INM with profiles based on aircraft weight corresponding to trip length;

* Compliance with FAR Part 36 for aircraft has been assumed by 1990;

* General aviation operations are assumed to operate primarily on Runway 01R/19L, since it is closest to the general aviation basing area and handles the majority of general aviation traffic; and

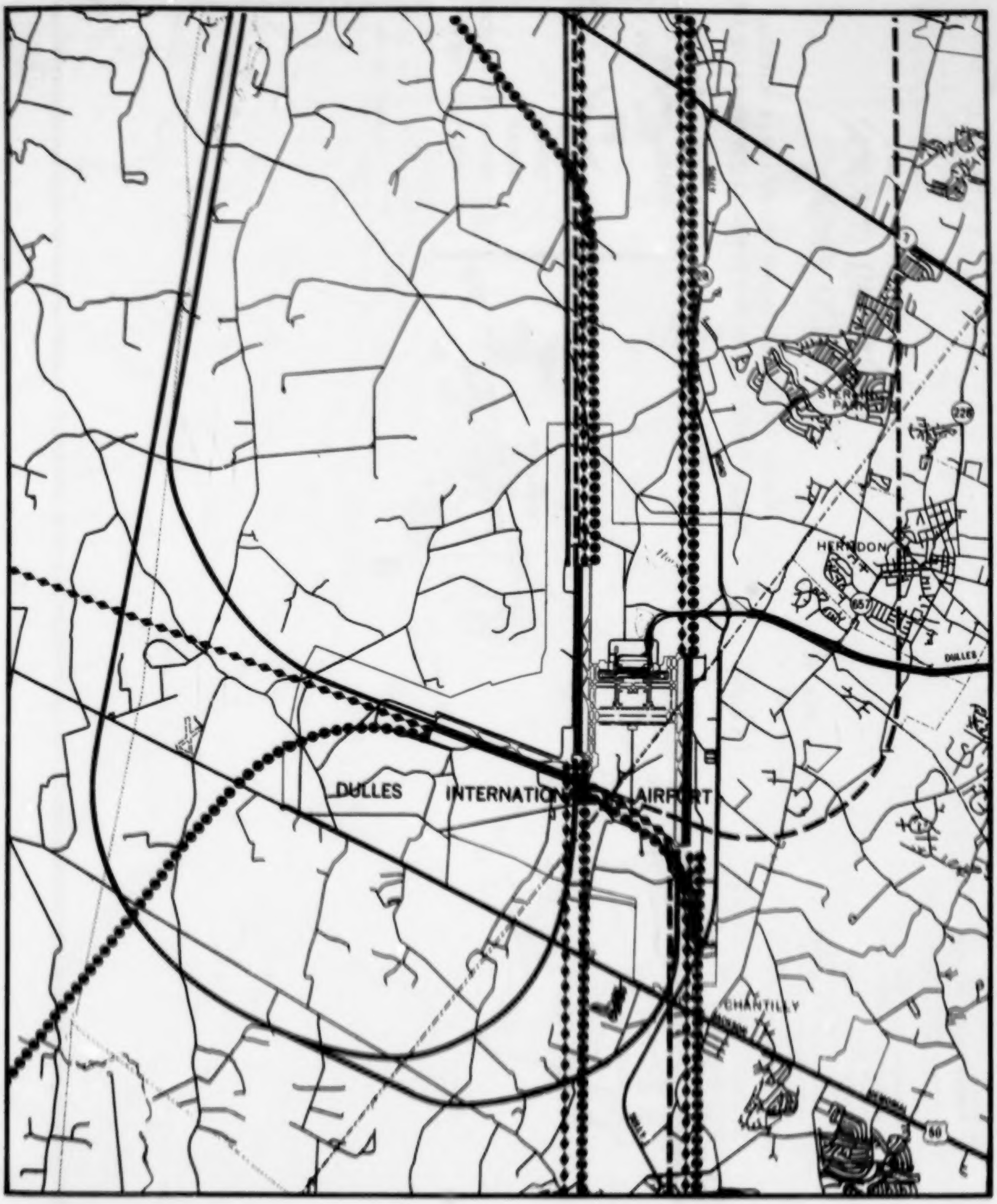
* The number of daily Concorde operations (takeoffs and landings) is set at two for existing conditions and six for future conditions. These operations are assumed to occur between 7 a.m. and 10 p.m.

Land Use and Sensitive Sites

Existing land use in the vicinity of Dulles is provided on Exhibit III-26. Special attention has been given to representative sensitive sites in the airport's noise influence area. For each site listed on the exhibit, tabular results of the noise analyses is provided. It should be noted that these representative historic sites include parks and recreation areas. Since noise represents the predominant impact on these sites, the discussion of impacts on historic sites, parks, and recreation areas have been incorporated into this noise discussion.

Existing Conditions

Table II-10 listed the operational data for existing conditions at Dulles. The existing noise condition at Dulles is


DULLES INTERNATIONAL AIRPORT
STERLING PARK
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LEGEND

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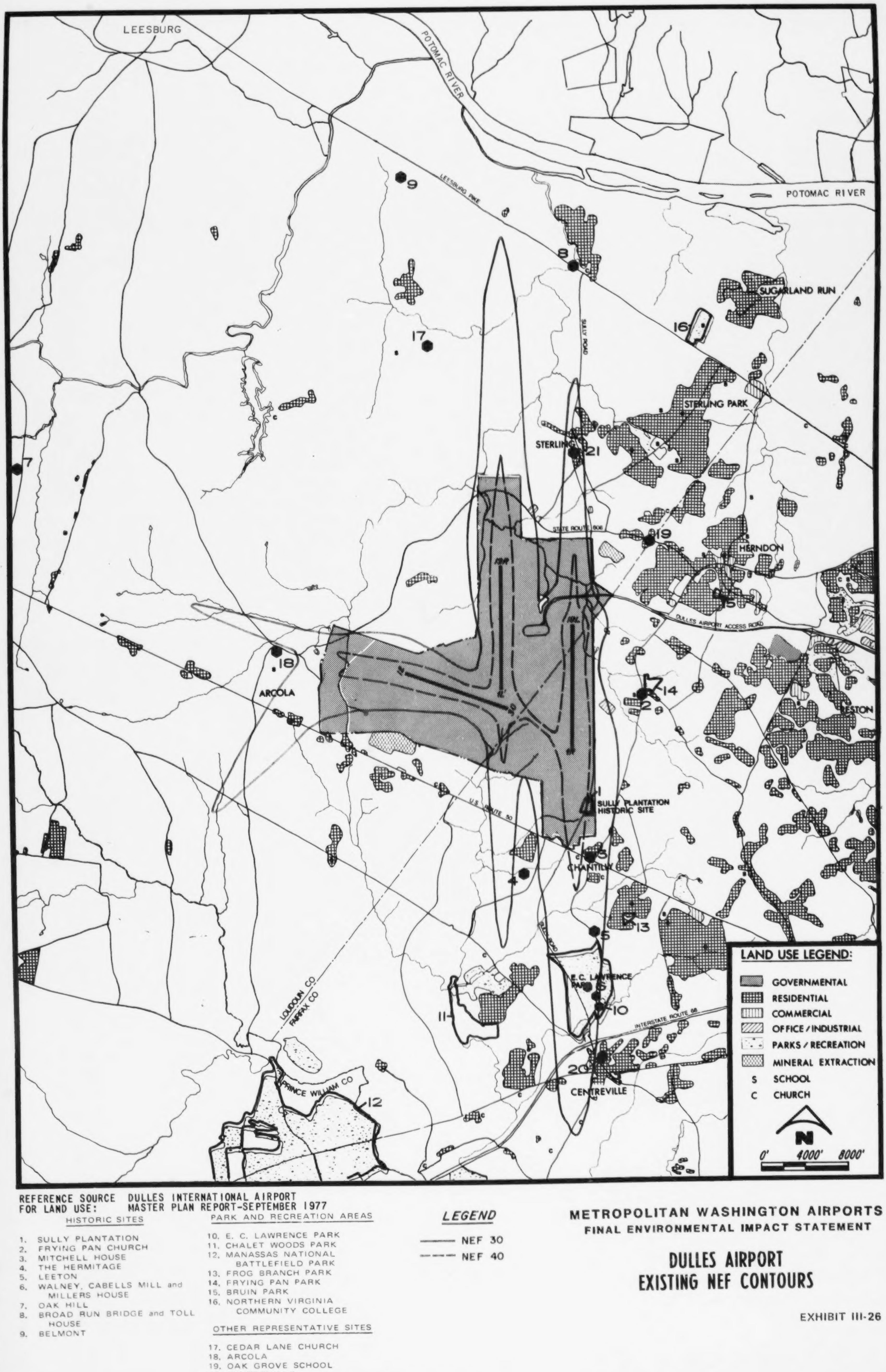
APPROACHES, CONCORD — — — — —

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

CENTERLINE OF FLIGHT CORRIDORS DULLES AIRPORT

EXHIBIT III-25


LEESBURG
POTOMAC RIVER
LEESBURG PIKE
SUGARLAND RUN
STERLING PARK
STERLING
SULLY ROAD
STATE ROUTE 606
HERNDON
DULLES AIRPORT ACCESS ROAD
RESTON
ARCOLA
SULLY PLANTATION HISTORIC SITE
U.S. ROUTE 50
CHANTILLY
E.C. LAWRENCE PARK
INTERSTATE ROUTE 66
CENTREVILLE
LOUDOUN CO
FAIRFAX CO
PRINCE WILLIAM CO
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LAND USE LEGEND:
GOVERNMENTAL
RESIDENTIAL
COMMERCIAL
OFFICE / INDUSTRIAL
PARKS / RECREATION
MINERAL EXTRACTION
S SCHOOL
C CHURCH
N
0'
4000'
8000'

REFERENCE SOURCE FOR LAND USE: DULLES INTERNATIONAL AIRPORT MASTER PLAN REPORT-SEPTEMBER 1977

HISTORIC SITES

1. SULLY PLANTATION
2. FRYING PAN CHURCH
3. MITCHELL HOUSE
4. THE HERMITAGE
5. LEETON
6. WALNEY, CABELLS MILL and MILLERS HOUSE
7. OAK HILL
8. BROAD RUN BRIDGE and TOLL HOUSE
9. BELMONT

PARK AND RECREATION AREAS

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11. CHALET WOODS PARK
12. MANASSAS NATIONAL BATTLEFIELD PARK
13. FROG BRANCH PARK
14. FRYING PAN PARK
15. BRUIN PARK
16. NORTHERN VIRGINIA COMMUNITY COLLEGE

OTHER REPRESENTATIVE SITES

17. CEDAR LANE CHURCH
18. ARCOLA
19. OAK GROVE SCHOOL
20. CENTREVILLE
21. STERLING

LEGEND

——— NEF 30
– – – NEF 40

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

DULLES AIRPORT
EXISTING NEF CONTOURS

EXHIBIT III-26

presented on Exhibit III-26 and in Table III-26. Exhibit III-26 indicates that the NEF 30 contour extends approximately 5.7 miles north and 4.4 miles north of the Runway 19R and 19L thresholds, respectively; approximately 4.5 and 6.8 miles south of the thresholds for Runways 01L and 01R, respectively; and 4.0 miles northwest of the Runway 12 threshold. The NEF 40 is much smaller and remains generally within the airport property. The total area covered by the NEF 30 contour is 26.3 square miles, while the NEF 40 contour covers about 4 square miles.

As can be seen, the existing NEF 40 is almost entirely within the border of the airport property line. No residential areas are within the NEF 40 zone. The NEF 30 contour covers generally undeveloped, rural land, except for park land and residential areas around Chantilly and Centreville south of the airport, and Sterling north of the airport. It is estimated that 4,500 people presently live within the NEF 30 contour.

Table III-26 lists NEF and Ldn noise exposure data at several representative sites in the airport influence area. The sites listed show that the NEF levels range from 19 to 35 and that the Ldn values range from 53 to 69. Noise exposure information for locations not identified within this table can be determined by locating the site in question on Exhibit III-26 and interpolating between the contours. Table A-7 in the Appendix, shows the time in minutes which specific noise levels are exceeded throughout the day at 21 sensitive sites near the airport.

Noise Abatement Policy

At Dulles, the following noise abatement controls have been implemented by the FAA:

* Land acquisition - nearly 10,000 acres of land were acquired when the airport was built in order to provide noise buffer zones;

* Preferential approach and departure tracks - Concorde operations are routed over predominantly non-noise sensitive areas; and

* Aircraft operation - Concorde operations employ a thrust reduction procedure on takeoffs.

Although Dulles is situated in a largely rural area and occupies a vast amount of land, single event noise impact is sometimes significant in certain areas.

Impacts of Policy Alternatives

The variation of aircraft operations and enplanements at National will result in changes in the total number of operations at Dulles. These operations are expected to follow the existing approach and departure tracks.

TABLE III-26

DULLES INTERNATIONAL AIRPORT
NOISE LEVELS AT REPRESENTATIVE SITES
RESULTING FROM AIRCRAFT OPERATIONS

	Sensitive[a] Site No.	Existing Conditions		No Policy Change		Expanded Growth Policy at National		Controlled Passenger Growth at National				Reduced Activity Policy at National	
								18 million		16 million			
		Ldn	NEF	Ldn	NEF	Ldn	NEF	Ldn	NEF	Ldn	NEF	Ldn	NEF
Sensitive Sites:													
Sully Plantation	1	69	35	71	35	71	35	72	36	72	36	73	37
Frying Pan Church	2	55	20	57	21	57	21	58	23	58	23	58	23
The Mitchell House	3	67	33	67	32	68	32	69	33	69	33	69	34
The Hermitage	4	64	29	68	31	68	32	69	32	69	32	69	32
Leeton	5	64	31	64	29	65	29	66	30	66	31	66	31
Walney, Bacell's Mill and Miller House	6	64	31	64	29	65	29	65	30	66	30	66	31
Oak Hill	7	44	9	45	9	45	10	46	10	46	11	46	11
Broadrun Bridge and Toll House	8	60	26	59	24	60	24	60	24	60	25	60	25
Belmont	9	58	25	60	24	60	25	61	26	61	26	62	26
E. C. Lawrence Park	10	64	31	64	29	65	29	65	30	66	30	66	31
Chalet Woods Park	11	61	27	60	25	60	25	61	26	61	26	62	27
Manassas National Battlefield Park	12	52	18	53	19	53	19	54	21	54	21	55	21
Frog Branch Park	13	57	23	58	23	58	24	59	25	59	25	60	26
Frying Pan Park	14	55	20	57	21	57	21	58	23	58	23	58	23
Bruin Park	15	51	16	54	18	54	19	55	20	55	20	55	20
Northern Virginia Community College	16	49	13	52	16	52	16	52	17	53	17	52	17
Cedar Lane Church	17	55	20	57	21	57	21	58	22	58	22	58	23
Arcola	18	60	26	61	26	61	26	62	27	62	27	63	28
Oak Grove School	19	53	19	55	20	56	21	56	22	57	22	57	22
Centreville	20	61	28	62	26	62	27	63	28	63	28	63	29
Sterling	21	65	33	63	28	63	28	64	29	64	29	64	29

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[a] See Exhibit III-26 for site location.

By 1990, two operational conditions would occur that would present different noise characteristics than now exist. First, the retrofit program described previously will be complete. With the exception of Concorde operations, this will generally result in single event noise levels being lower than at present. Table III-26, presented earlier in this report, indicates changes in noise levels which will occur at Dulles. Second, a relatively quiet new generation of aircraft is expected to be in the airlines' fleet mix by 1990.

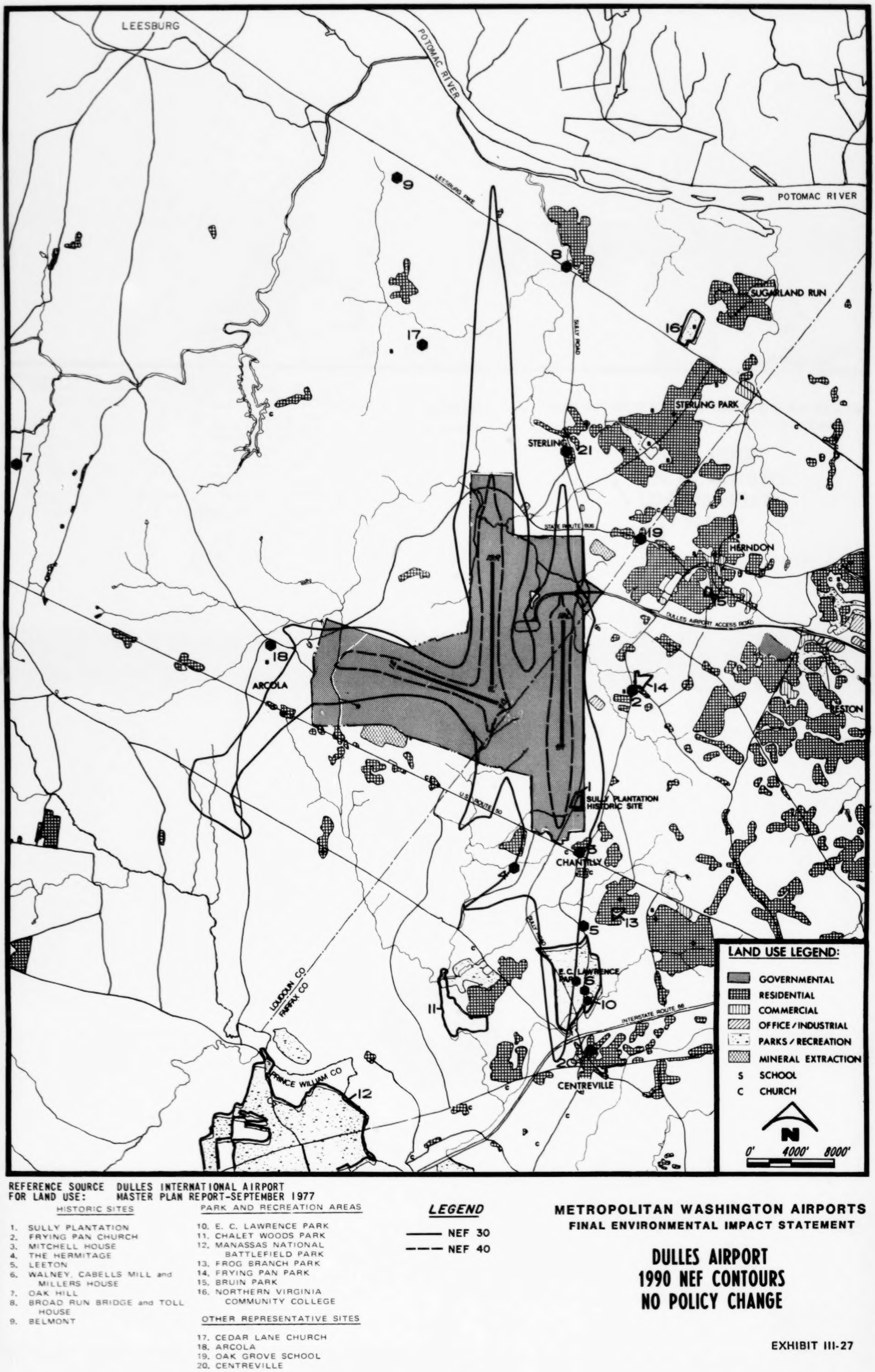
Table II-10 lists the operational data expected at Dulles for each of the policy alternatives. Table III-26 and Exhibits III-27 through III-31 indicate the level of noise exposure anticipated to result from each of the policy options. In addition, Appendix Tables A-8 through A-12 provide time above (TA) data at representative sensitive sites at Dulles for each of the policy alternatives.

Comparative Summary of Noise Impacts

A comparison of the noise data by alternative is provided in Table III-26 and on Exhibit III-32. As can be seen, noise exposure is not significantly different between alternatives. Exhibit III-32 indicates that the area of noise exposure within the NEF 30 contour ranges from a maximum of 32.1 square miles under the Reduced Activity at National alternative to a minimum of 23.6 square miles under the No Policy Change condition. Population also reflects only marginal changes, with the total number of people estimated to live within the NEF 30 contour ranging from 3,500 to 6,000 persons.

By comparing the time above noise exposure data in Appendix Tables A-8 through A-12, it can be seen that only relatively small differences in noise exposure result from policy alternatives at noise sensitive sites in the vicinity of Dulles.

Thus, the noise exposure will generally increase at Dulles as operational and enplanement restrictions increase at National. However, the magnitude of this increase is not expected to result in significant changes in the noise environment around the airport.


LEESBURG
POTOMAC RIVER
LEESBURG PIKE
SUGARLAND RUN
STERLING PARK
STERLING
SULLY ROAD
STATE ROUTE 606
HERNDON
DULLES AIRPORT ACCESS ROAD
RESTON
ARCOLA
U.S. ROUTE 50
SULLY PLANTATION HISTORIC SITE
CHANTILLY
E.C. LAWRENCE PARK
INTERSTATE ROUTE 66
CENTREVILLE
LOUDOUN CO
FAIRFAX CO
PRINCE WILLIAM CO
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LAND USE LEGEND:
GOVERNMENTAL
RESIDENTIAL
COMMERCIAL
OFFICE / INDUSTRIAL
PARKS / RECREATION
MINERAL EXTRACTION
S SCHOOL
C CHURCH
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0' 4000' 8000'

REFERENCE SOURCE DULLES INTERNATIONAL AIRPORT
FOR LAND USE: MASTER PLAN REPORT-SEPTEMBER 1977

HISTORIC SITES

1. SULLY PLANTATION
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3. MITCHELL HOUSE
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9. BELMONT

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14. FRYING PAN PARK
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18. ARCOLA
19. OAK GROVE SCHOOL
20. CENTREVILLE
21. STERLING

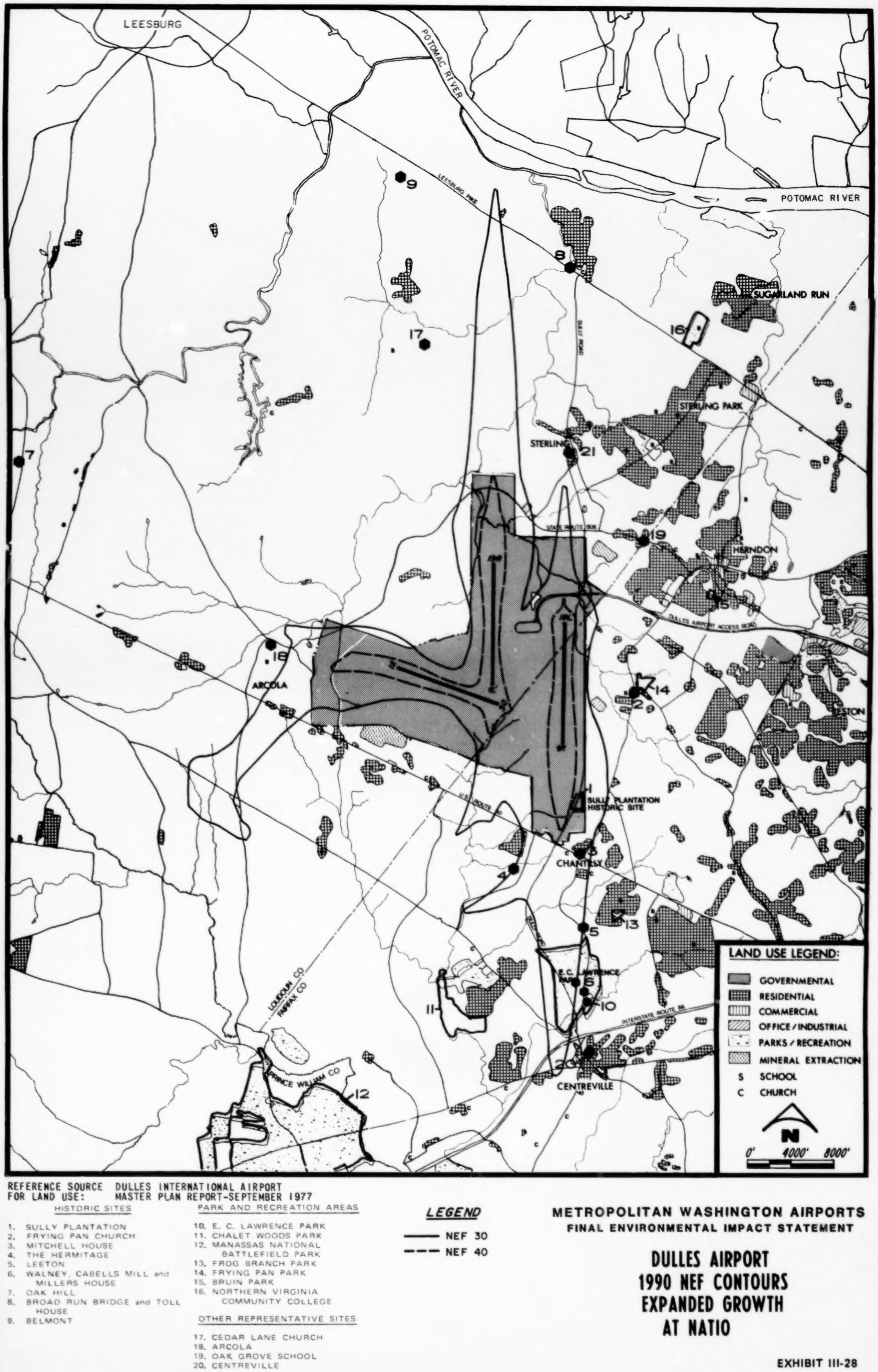
LEGEND

—— NEF 30
— — — NEF 40

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

DULLES AIRPORT
1990 NEF CONTOURS
NO POLICY CHANGE

EXHIBIT III-27


LEESBURG
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CHANTILLY
E.C. LAWRENCE PARK
INTERSTATE ROUTE 66
CENTREVILLE
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FAIRFAX CO
PRINCE WILLIAM CO
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LAND USE LEGEND:
GOVERNMENTAL
RESIDENTIAL
COMMERCIAL
OFFICE / INDUSTRIAL
PARKS / RECREATION
MINERAL EXTRACTION
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REFERENCE SOURCE DULLES INTERNATIONAL AIRPORT
FOR LAND USE: MASTER PLAN REPORT-SEPTEMBER 1977

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13. FROG BRANCH PARK
14. FRYING PAN PARK
15. BRUIN PARK
16. NORTHERN VIRGINIA COMMUNITY COLLEGE

OTHER REPRESENTATIVE SITES

17. CEDAR LANE CHURCH
18. ARCOLA
19. OAK GROVE SCHOOL
20. CENTREVILLE
21. STERLING

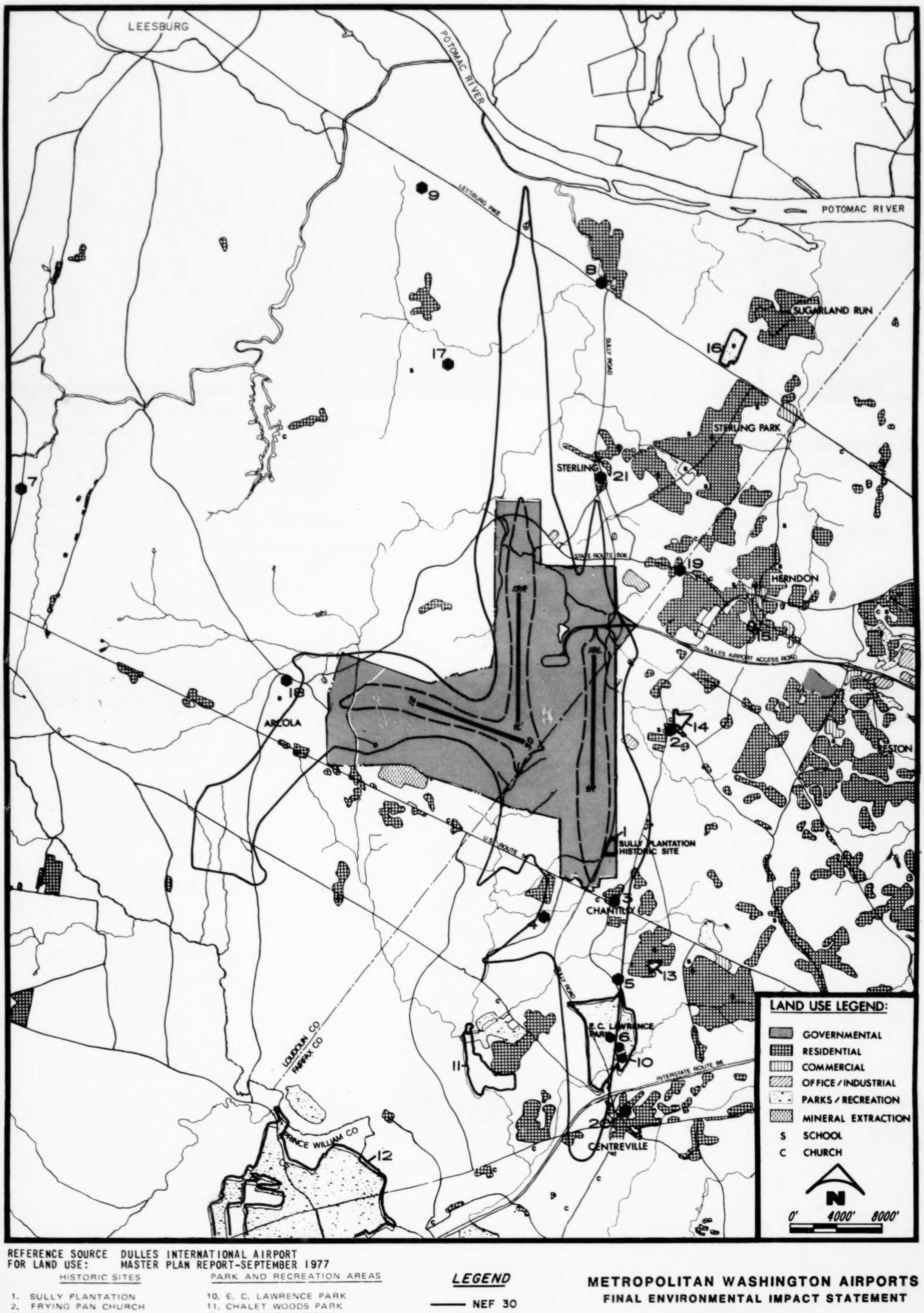
LEGEND

—— NEF 30
– – – NEF 40

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

DULLES AIRPORT
1990 NEF CONTOURS
EXPANDED GROWTH
AT NATIO

EXHIBIT III-28


LEESBURG
POTOMAC RIVER
POTOMAC RIVER
LEESBURG PIKE
SUGARLAND RUN
STERLING PARK
STERLING
SULLY ROAD
STATE ROUTE 606
HERNDON
DULLES AIRPORT ACCESS ROAD
RESTON
ARCOLA
U.S. ROUTE 50
SULLY PLANTATION HISTORIC SITE
CHANTILLY
E.C. LAWRENCE PARK
INTERSTATE ROUTE 66
CENTREVILLE
LOUDOUN CO
FAIRFAX CO
PRINCE WILLIAM CO
1
2
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20
21
LAND USE LEGEND:
GOVERNMENTAL
RESIDENTIAL
COMMERCIAL
OFFICE / INDUSTRIAL
PARKS / RECREATION
MINERAL EXTRACTION
S SCHOOL
C CHURCH
N
0'
4000'
8000'

REFERENCE SOURCE DULLES INTERNATIONAL AIRPORT
FOR LAND USE: MASTER PLAN REPORT-SEPTEMBER 1977

HISTORIC SITES

1. SULLY PLANTATION
2. FRYING PAN CHURCH
3. MITCHELL HOUSE
4. THE HERMITAGE
5. LEETON
6. WALNEY, CABELLS MILL and MILLERS HOUSE
7. OAK HILL
8. BROAD RUN BRIDGE and TOLL HOUSE
9. BELMONT

PARK AND RECREATION AREAS

10. E. C. LAWRENCE PARK
11. CHALET WOODS PARK
12. MANASSAS NATIONAL BATTLEFIELD PARK
13. FROG BRANCH PARK
14. FRYING PAN PARK
15. BRUIN PARK
16. NORTHERN VIRGINIA COMMUNITY COLLEGE

OTHER REPRESENTATIVE SITES

17. CEDAR LANE CHURCH
18. ARCOLA
19. OAK GROVE SCHOOL
20. CENTREVILLE
21. STERLING

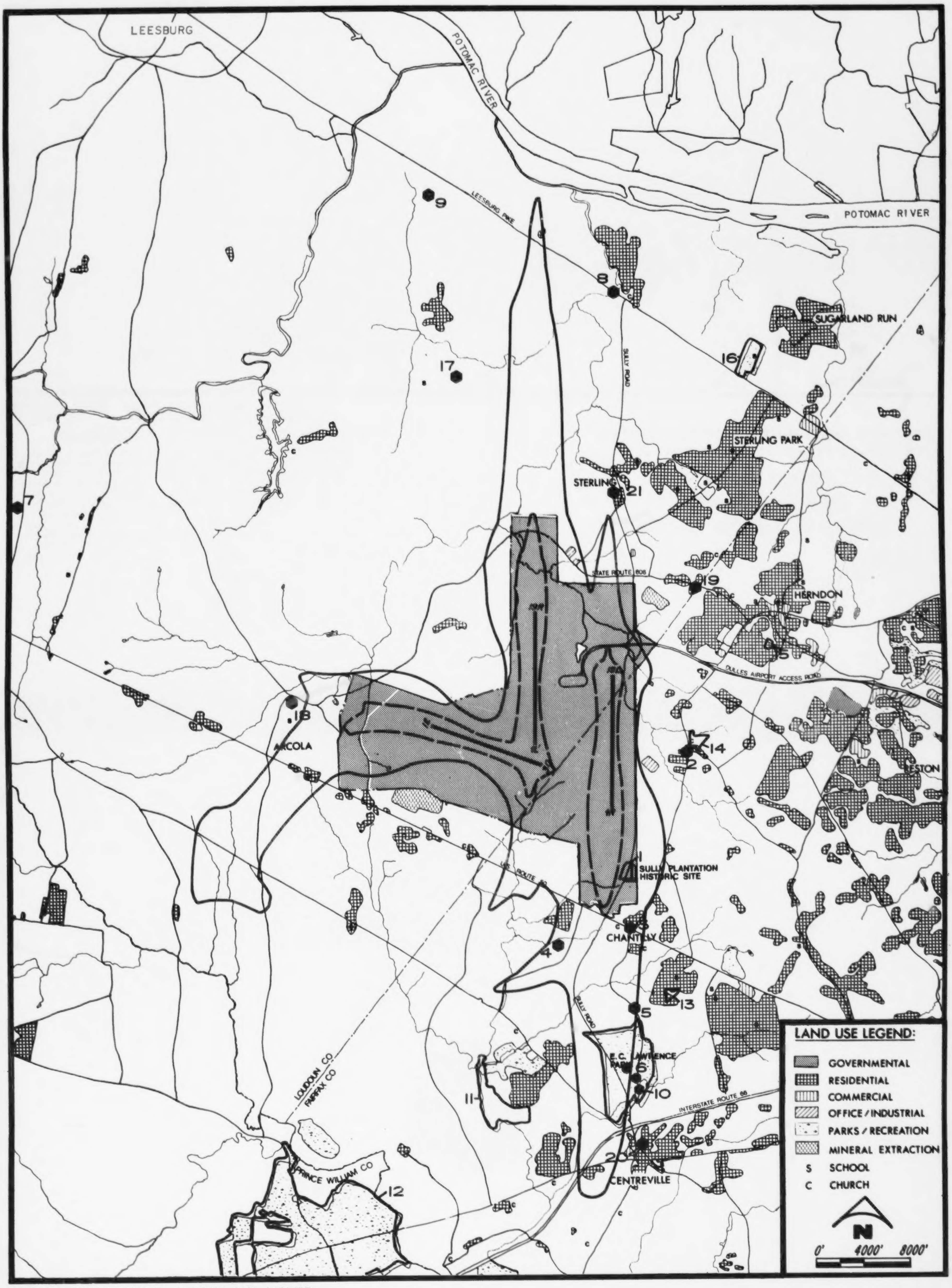
LEGEND

——— NEF 30
— — — NEF 40

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

DULLES AIRPORT
1990 NEF CONTOURS
CONTROLLED GROWTH TO 18 MILLION PASSENGERS AT NATIONAL

EXHIBIT III-29


LEESBURG
POTOMAC RIVER
POTOMAC RIVER
LEESBURG PIKE
SUGARLAND RUN
STERLING PARK
STERLING
SULLY ROAD
STATE ROUTE 606
HERNDON
DULLES AIRPORT ACCESS ROAD
RESTON
ARCOLA
SULLY PLANTATION HISTORIC SITE
CHANTILLY
E.C. LAWRENCE PARK
INTERSTATE ROUTE 66
CENTREVILLE
LOUDOUN CO
FAIRFAX CO
PRINCE WILLIAM CO
U.S. ROUTE 50
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21
LAND USE LEGEND:
GOVERNMENTAL
RESIDENTIAL
COMMERCIAL
OFFICE / INDUSTRIAL
PARKS / RECREATION
MINERAL EXTRACTION
S SCHOOL
C CHURCH
N
0' 4000' 8000'

REFERENCE SOURCE FOR LAND USE: DULLES INTERNATIONAL AIRPORT MASTER PLAN REPORT-SEPTEMBER 1977

HISTORIC SITES

1. SULLY PLANTATION
2. FRYING PAN CHURCH
3. MITCHELL HOUSE
4. THE HERMITAGE
5. LEETON
6. WALNEY, CABELLS MILL and MILLERS HOUSE
7. OAK HILL
8. BROAD RUN BRIDGE and TOLL HOUSE
9. BELMONT

PARK AND RECREATION AREAS

10. E. C. LAWRENCE PARK
11. CHALET WOODS PARK
12. MANASSAS NATIONAL BATTLEFIELD PARK
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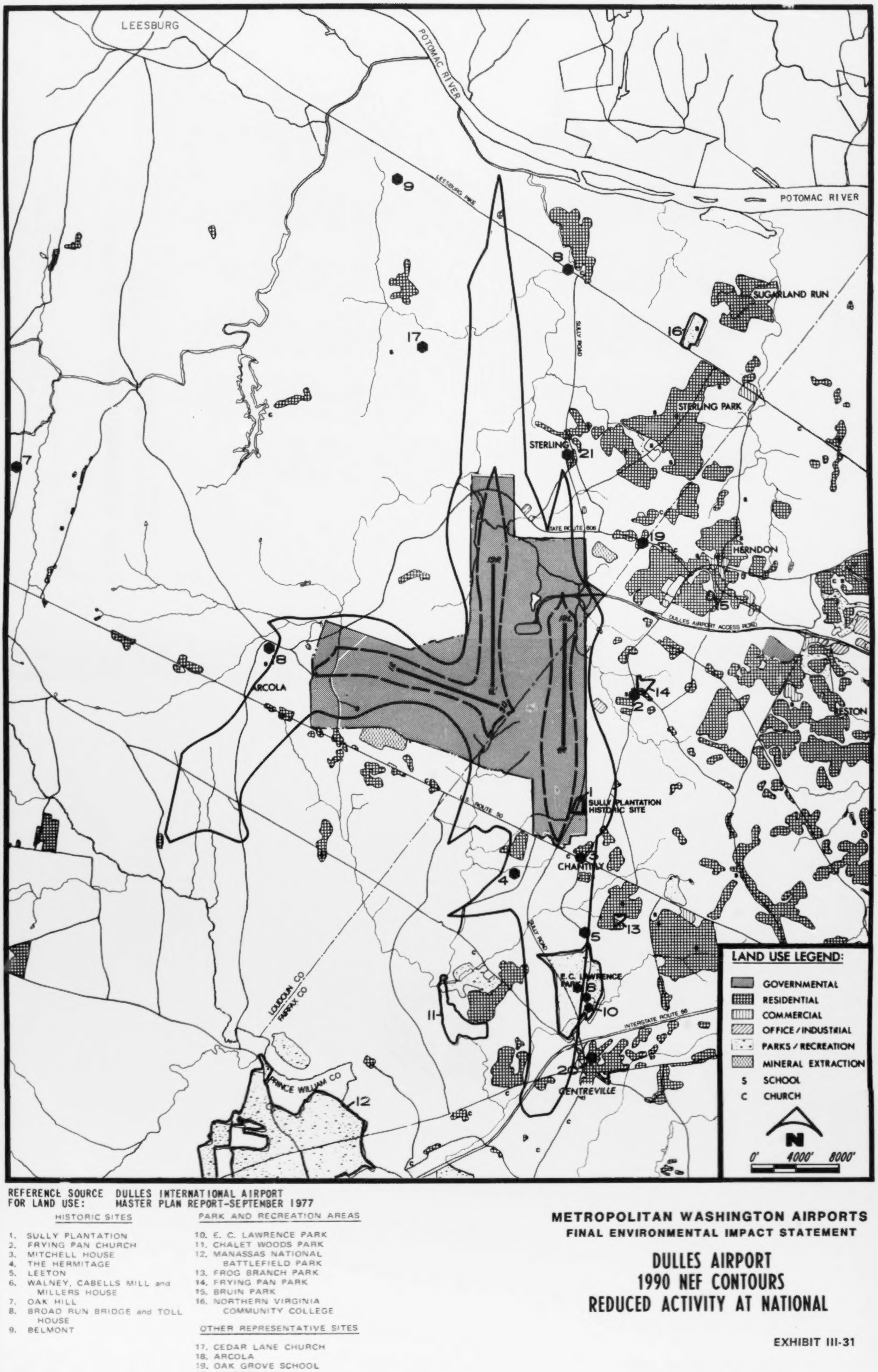
OTHER REPRESENTATIVE SITES

17. CEDAR LANE CHURCH
18. ARCOLA
19. OAK GROVE SCHOOL
20. CENTREVILLE
21. STERLING

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

DULLES AIRPORT
1990 NEF CONTOURS
CONTROLLED GROWTH TO 16 MILLION PASSENGERS AT NATIONAL

EXHIBIT III-30


LEESBURG
POTOMAC RIVER
LEESBURG PIKE
SUGARLAND RUN
STERLING PARK
STERLING
SULLY ROAD
STATE ROUTE 606
HERNDON
DULLES AIRPORT ACCESS ROAD
RESTON
ARCOLA
SULLY PLANTATION HISTORIC SITE
U.S. ROUTE 50
CHANTILLY
E.C. LAWRENCE PARK
INTERSTATE ROUTE 66
CENTREVILLE
LOUDOUN CO
FAIRFAX CO
PRINCE WILLIAM CO
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21
LAND USE LEGEND:
GOVERNMENTAL
RESIDENTIAL
COMMERCIAL
OFFICE / INDUSTRIAL
PARKS / RECREATION
MINERAL EXTRACTION
S SCHOOL
C CHURCH
N
0'
4000'
8000'

REFERENCE SOURCE DULLES INTERNATIONAL AIRPORT
FOR LAND USE: MASTER PLAN REPORT-SEPTEMBER 1977

HISTORIC SITES

1. SULLY PLANTATION
2. FRYING PAN CHURCH
3. MITCHELL HOUSE
4. THE HERMITAGE
5. LEETON
6. WALNEY, CABELLS MILL and MILLERS HOUSE
7. OAK HILL
8. BROAD RUN BRIDGE and TOLL HOUSE
9. BELMONT

PARK AND RECREATION AREAS

10. E. C. LAWRENCE PARK
11. CHALET WOODS PARK
12. MANASSAS NATIONAL BATTLEFIELD PARK
13. FROG BRANCH PARK
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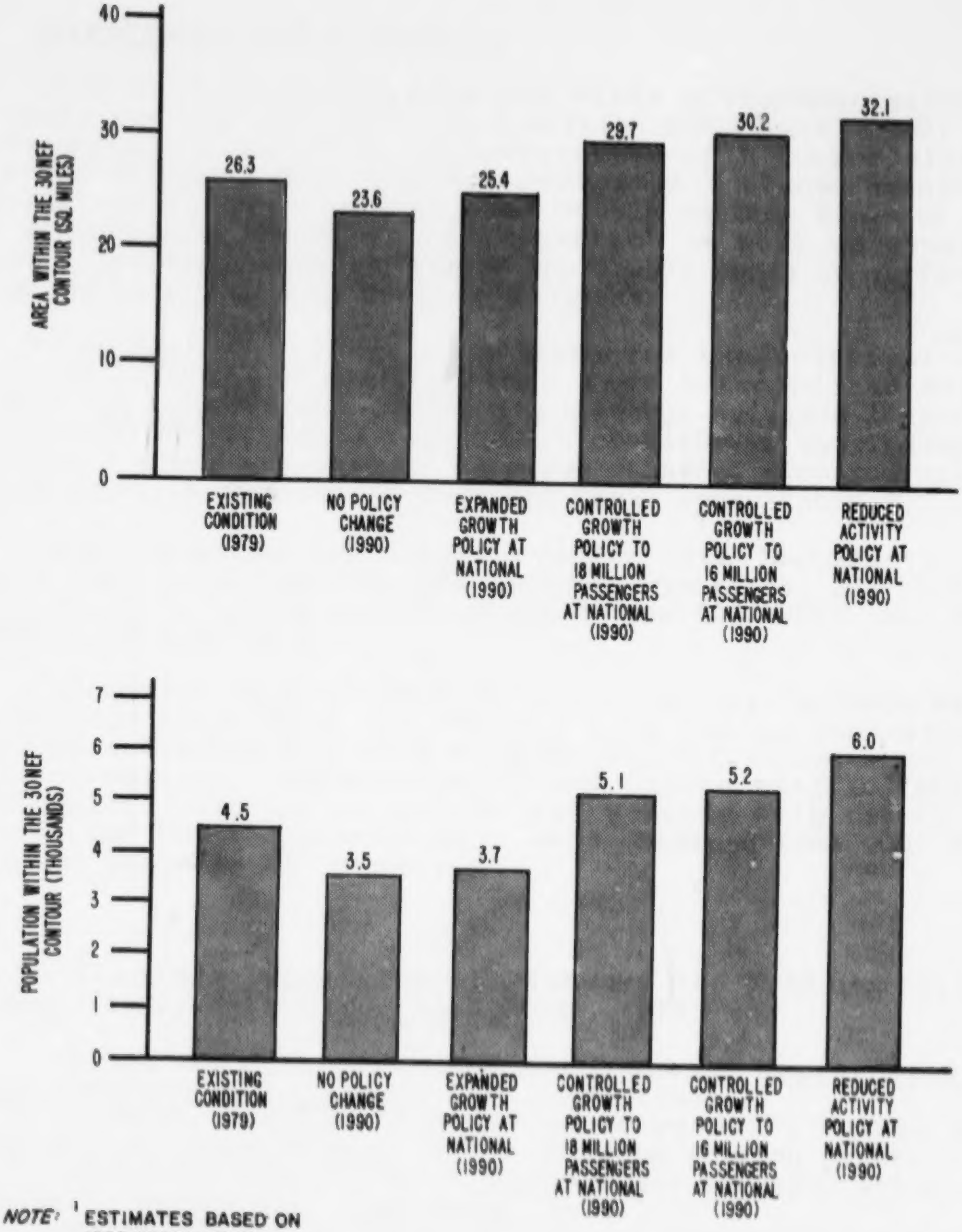
OTHER REPRESENTATIVE SITES

17. CEDAR LANE CHURCH
18. ARCOLA
19. OAK GROVE SCHOOL
20. CENTREVILLE
21. STERLING

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

DULLES AIRPORT
1990 NEF CONTOURS
REDUCED ACTIVITY AT NATIONAL

EXHIBIT III-31



NOTE: [1] ESTIMATES BASED ON 1980 POPULATION.

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

ALTERNATIVE NOISE IMPACT COMPARISONS AT DULLES

EXHIBIT III-32

SURFACE ACCESS

Introduction and Methodology

This section summarizes the surface transportation access analyses for the 1979 Existing Condition and future (1990) projected conditions assuming implementation of a future alternative aviation policy. The analyses performed included examination of average week, peak weekday, and hourly vehicle flows of arriving and departing airport-related traffic, as well as general non-airport through-traffic flows. Applicable modes of surface transportation were included in these analyses.

Existing general traffic data for the principal roadways adjacent to Dulles was obtained from Metropolitan Washington Council of Governments (COG), the Federal Aviation Administration (FAA), and the Virginia Department of Highways and Transportation (VDHT). Future non-airport data was obtained from the Transportation Planning Department of VDHT and their consultants.[1]

These existing and future traffic data factors (i.e., mode split, vehicle occupancy, and vehicle trip rates) for both airport and non-airport traffic were obtained from COG, VDHT, and FAA study projects and reports.[2]

Volumes of airport-related vehicular traffic were determined by applying mode split and vehicle trip generation rates to the existing and projected level of passenger originations and terminations at Dulles. These existing and future traffic data factors (mode split, vehicle occupancy, and vehicle trip rates) for both airport and non-airport traffic were obtained from COG, VDHT, and FAA study projects and reports.[2]

---

[1] Virginia Department of Highways and Transportation, JHK and Associates, Dulles Toll Road Study, 1979.

[2] Peat, Marwick, Mitchell and Company, Master Plan Report, Dulles International Airport, 1977 Draft Final.

-Howard, Needles, Tammen and Bergendoff, Dulles International Airport Access Study, 1977. Various working papers.

-Virginia Department of Highways and Transportation, JHK and Associates, Dulles Toll Road Study, 1979.

-Metropolitan Washington Council of Governments, National Capital Region Transportation Planning Board, Metro Core Cordon Count of Vehicular and Passenger Volumes (Summary), 1976.

-Op. cit., The Future of Washington's Airports (Summary Report), 1975.

-U.S. Department of Transportation, Federal Aviation Administration, Office of Aviation Policy, Profiles of Scheduled Air Carrier Passenger Traffic for Top 100 U.S. Airports, 1977.

Based upon the data and reports received from the various agencies previously noted, the following assumptions were made for calculating vehicle trips associated with Dulles:

1979 Existing Condition Analysis

- Average week originating and terminating (O and T) passengers = 62,900;
- Peak day volume of average week O and T passengers = 15.9 percent;
- Airport-related transit mode split = 15 percent;[1]
- Airport-related two-way vehicle trip rate = 2.54 trips per originating and terminating passenger; and
- Vehicle occupancy rate = 1.3 passengers per vehicle.

1990 Policy Alternatives Analysis

- Average week originating and terminating (O and T) passengers ranges from 128,700 to 192,000;
- Peak day volume of average week O and T passengers = 15.9 percent;
- Airport-related transit mode split = 20 percent;[2]
- Airport-related two-way vehicle trip rate = 2.38[3] trips per originating and terminating passenger; and
- Vehicle occupancy rate = 1.6 passengers per vehicle.

For the purposes of future year analyses, it was assumed that implementation of the recommended Dulles Access Plan as provided in the Dulles International Airport Access Study would be accomplished by 1990. This plan would significantly affect both passenger-related and employee vehicle trip production associated with Dulles. A key element of the plan is the interface of the Metro

---

[1] Metropolitan Washington Council of Governments, and Howard, Needles, Tammen and Bergendoff, Dulles International Airport Access Study, 1978.

[2] Assumed increase in airport transit from 1978 level of 15 percent to 20 percent based upon enhanced Metro accessibility (shuttle operation), expanded Express Bus usage, and continuing energy constraints with resultant travel-cost penalties.

[3] Based upon preliminary update to access traffic forecasts by Master Plan consultants Peat, Marwick, Mitchell and Company, July 1980, and 1977 Dulles Draft Master Plan.

Vienna Line extension at West Falls Church Station and the airport. A special "bus only" loading facility is being constructed in the median of I-66 at the West Falls Church Station. This bus facility will have direct ramp access from the Dulles Airport Access Road. Dulles Airport passengers will be able to conveniently transfer between bus and rail at this station. In addition, the station is designed to allow airport passengers to transfer from airport express buses to local feeder buses which serve Falls Church and portions of Arlington County and Fairfax County.[1]

The peak hour of passenger activity for Dulles is 5-6 PM and represents approximately 18 percent of the total daily enplanements and deplanements (11.8 percent of daily deplaning and 24.6 percent of daily enplaning during peak hour). For the 1990 analyses, a PM peak hour of 5-6 PM is utilized to assess the impact of policy changes on airport-related traffic.

Under existing conditions, the heaviest PM peak movements of through or non-airport traffic is generally from 5-7 PM. Current PM peak hour percentages on local area roadways were assumed to remain constant in the future. The airport percentage of combined total traffic on a peak weekday is assumed to be approximately 7.5 percent.[2]

The general study methodology and analysis procedures described previously for the National traffic assessment were also utilized for Dulles, including level of service assessments.

The area of surface transportation impact for Dulles is delineated by Centreville Road (Virginia Route 657) on the east, U.S. Route 50 on the south, Sterling Road (Virginia Route 606) on the north, and the Dulles internal roadway system on the west. The principal roadways affected are Sully Road (Virginia Route 28), the Dulles Access Road, and the Sully Road/Dulles Access Road interchange. This surface transportation impact area was disaggregated into specific access roadway links to allow detailed investigation of specific travel corridor characteristics.

Existing Conditions

The principal surface access route to Dulles is via the Dulles Access Road, a limited access, four-lane, divided facility constructed to Interstate standards. The highway extends to the east from the airport toward Washington, a distance of over 13 miles, at which point it joins Interstate 495 (Beltway) via a directional interchange and continues a short distance to a terminus at Virginia Route 123. Other access roads in the general vicinity of Dulles are U.S. Route 50 to the south, Sully Road (Virginia Route 28) to the east, and Virginia Route 7 to the north.

---

[1] Communications with Washington Metropolitan Area Transit Authority, April 1980.

-Metropolitan Washington Council of Governments, and Howard, Needles, Tammen and Bergendoff, Dulles International Airport Access Study, 1978.

[2] Peat, Marwick, Mitchell and Company, Draft Final Master Plan Report, Dulles International Airport, 1977.

Except for interchanges at Wolf Trap Farm, Reston Avenue, and Interstate 495, Dulles Access Road interchanges serve traffic only to and from the airport. The Wolf Trap Farm interchange, opened in 1971, provides access on and off the highway only for traffic during performances at this cultural facility. The Reston Avenue facility is a full diamond interchange; however, use of the ramps to and from downtown Washington is restricted to high occupancy vehicles (HOV) and commuter bus operations. These ramps were opened in 1973. The Interstate 495 interchange provides access on and off the Interstate highway for traffic to and from the airport, as well as Virginia Route 123.

The Dulles Access Road is the principal access route with 80 percent of all airport-related vehicle trips, or approximately 20,000 trips daily. The latest average weekday traffic counts on the Dulles Access Road show 38,000 ADT west of Sully Road and approximately 28,000 estimated ADT east of Sully Road.[1]

The 1977 Draft Master Plan for Dulles indicated that 50 percent to 60 percent of the traffic to and from the airport enters or leaves the access highway at the internal airport service road interchange. The traffic entering or exiting the highway at this service road interchange is composed of employee, service, and non-airport commuter vehicles.

Non-airport vehicle trips using the east-west overpass execute a U-turn and immediately leave the airport. These data and observations by the Dulles Airport Police and FAA consultants[2] indicate that the vehicles are driven by local commuters who use the Dulles Access Road as a means of reaching Metropolitan Washington. This phenomenon is locally referred to as "commuter backtracking." According to the latest counts on the Dulles Access Road, approximately 33 to 36 percent of the total daily traffic west of Sully Road are commuter backtrackers. The commuter backtracking peaks during the evening from 6-7 PM with over 16 percent of the daily commuter flow occurring in that time period. The 5-6 PM airport-related peak period, however, is much less congested with only 5 percent of the daily commuter traffic occurring in conjunction with the peak airport traffic.

---

[1] Based upon January 1980 survey counts taken by JHK and Associates for the Federal Aviation Administration and the Virginia Department of Highways and Transportation.

[2] Ibid.

These recent vehicle counts also indicate that during the 7-8 AM period, commuters have actually composed nearly 100 percent of all vehicles entering the airport grounds. These volumes have on a regular basis resulted in significant queueing at the service roads, Airport Access Road, and the arrival and departure ramps at the terminal. Volumes in excess of 1,000 commuter-vehicles for one hour periods are not uncommon.

The latest traffic counts on Sully Road north and south of the Airport Road interchange indicate between approximately 10,700 and 10,900 vehicles per day (two-way) utilizing the facility. Currently, Sully Road provides access for approximately 20 percent of the airport users, or approximately 5,100 trips daily.

Exhibit III-33 provides existing airport and non-airport vehicle volumes on roadways within the impact area of Dulles.

Based upon the volumes shown on Exhibit III-33, level of traffic service calculations were conducted for selected access roadway (AR) links. The results of the level of service assessment are presented in Table III-27 and indicate that all roadway links are operating at acceptable levels of service during the PM peak hour.

Impacts of Policy Alternatives

This section assesses the probable surface transportation impacts resulting from implementation of the various alternative policies.

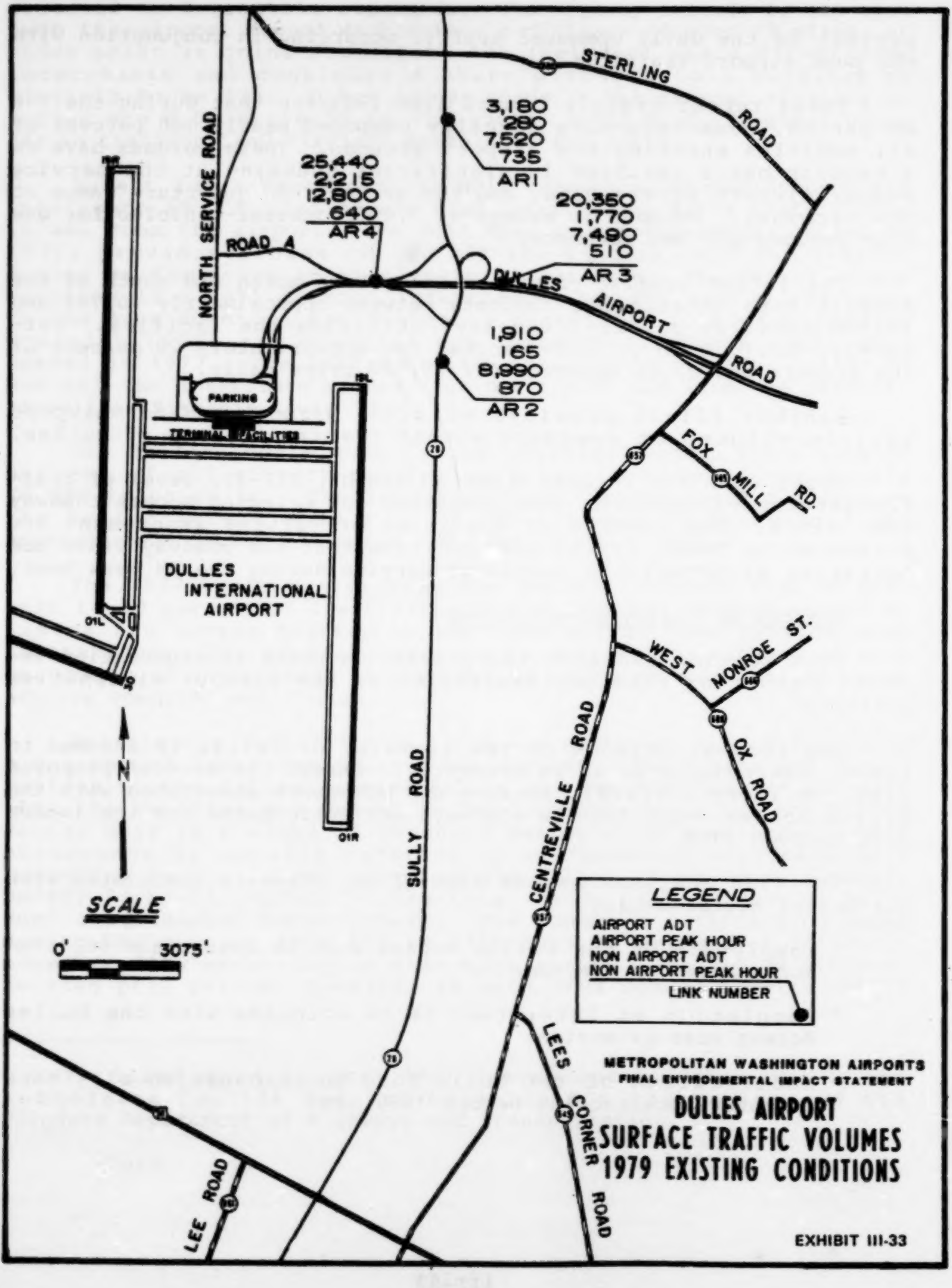
The roadway network in the vicinity of Dulles is assumed to remain essentially as it is presently. Except for several proposed plans to improve traffic service and movements associated with the Dulles Access Road, no new roadways are anticipated for the impact area through 1990.

The 1990 analyses assume several key elements associated with the Dulles Access Road:

- Completion of the Dulles Access Road to Interstate 66, commonly known as "Section 5;"

- Completion of Interstate 66 to coincide with the Dulles Access Road extension;

- Modification of the Sully Road interchange to eliminate commuter backtracking before 1990; and


STERLING ROAD
3,180
280
7,520
735
AR1
NORTH SERVICE ROAD
25,440
2,215
12,800
640
AR4
20,350
1,770
7,490
510
AR3
ROAD A
DULLES AIRPORT ROAD
1,910
165
8,990
870
AR2
PARKING
TERMINAL FACILITIES
28
FOX MILL RD.
DULLES INTERNATIONAL AIRPORT
01L
01R
19L
19R
WEST MONROE ST.
OX ROAD
N
SULLY ROAD
CENTREVILLE ROAD
SCALE
0'
3075'
LEGEND
AIRPORT ADT
AIRPORT PEAK HOUR
NON AIRPORT ADT
NON AIRPORT PEAK HOUR
LINK NUMBER
LEES CORNER ROAD
LEE ROAD

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

DULLES AIRPORT
SURFACE TRAFFIC VOLUMES
1979 EXISTING CONDITIONS

EXHIBIT III-33

TABLE III-27

ACCESS ROADWAY LEVELS OF SERVICE DULLES INTERNATIONAL AIRPORT

1979 EXISTING CONDITIONS

ACCESS ROADWAY LINK	PEAK ONE-WAY VOLUME	VOLUME/ CAPACITY RATIO	LEVEL OF SERVICE
AR1	660	0.66	C
AR2	675	0.68	C
AR3	1,370	0.34	A
AR4	1,715	0.43	B

- * The addition of one lane in each direction to the Dulles Access Road west of Sully Road, as provided for in the Master Plan.

The analyses assume the aforementioned projects would be completed and operational before 1990.

Recent Dulles studies have indicated that the probable transit modal split for airport-user access trips will increase from the existing level of 15 percent to 20 percent in the future.[1] This assumption includes Metro Rail extension to West Falls Church Station and Metro Shuttle Bus connections from Dulles within the study time frame.

Current directions of approach and departures for airport-related trips were assumed to remain constant for the assessment period.

The 1990 analyses for Dulles utilize the same policy alternatives described previously in this section. All policy alternatives would increase daily and peak hour Dulles airport-related traffic volumes on the pertinent external roadways above those presently experienced. Provided in the text and associated exhibits and tables is an evaluation of the possible impacts resulting from each policy.

No Policy Change

The No Policy Change alternative is expected to increase daily airport-related vehicle flows by approximately 95 percent, or 24,000 vehicle trips (two-way), above those experienced in 1979.

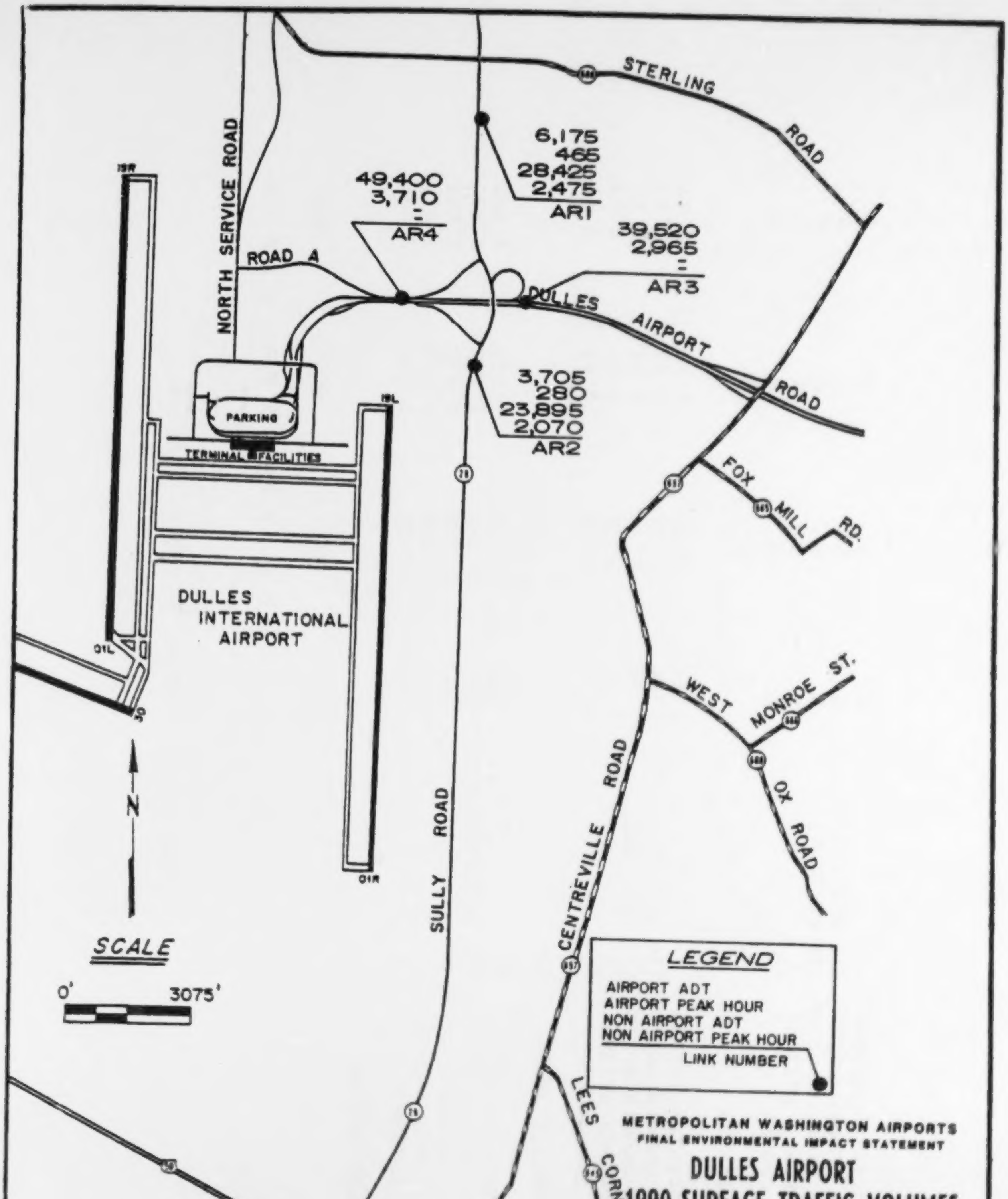
Exhibit III-34 shows the projected airport and non-airport traffic volumes for the year 1990 under the No Policy Change alternative plan. Table III-28 provides a generalized review of calculated future levels of service for selected access roadway (AR) links based upon the volumes shown on Exhibit III-34. The results of the LOS assessment shown in Table III-28 indicates that the two segments of Sully Road (AR1 and AR2) could experience a significant reduction in the anticipated levels of service by 1990. Additionally, AR3 (Dulles Access Road east of Sully Road) drops from LOS

---

[1] Howard, Needles, Tammen and Bergendoff, Dulles International Airport Access Study, 1977. Various working papers.

-Assumed increase in airport transit from 1978 level based upon enchanced Metro accessibility (shuttle operation), expanded Express Bus usage, and continuing energy constraints with resultant travel-cost penalties.

-Communications with Master Plan consultants Peat, Marwick, Mitchell and Company, July 1980, and 1977 Dulles Draft Master Plan.


STERLING ROAD
6,175
465
28,425
2,475
AR1
49,400
3,710
=
AR4
39,520
2,965
=
AR3
NORTH SERVICE ROAD
ROAD A
DULLES AIRPORT ROAD
PARKING
TERMINAL FACILITIES
3,705
280
23,895
2,070
AR2
19R
19L
28
FOX MILL RD.
DULLES INTERNATIONAL AIRPORT
01L
30
01R
WEST MONROE ST.
OX ROAD
CENTREVILLE ROAD
SULLY ROAD
N
SCALE
0'
3075'
LEGEND
AIRPORT ADT
AIRPORT PEAK HOUR
NON AIRPORT ADT
NON AIRPORT PEAK HOUR
LINK NUMBER
LEES CORNER ROAD
LEE ROAD

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

DULLES AIRPORT
1990 SURFACE TRAFFIC VOLUMES
NO POLICY CHANGE

EXHIBIT III-34

TABLE III-28

1990 ACCESS ROADWAY LEVELS OF SERVICE
DULLES INTERNATIONAL AIRPORT

	ACCESS ROADWAY LINKS			
	AR1	AR2	AR3	AR4
Peak One-Way Volume				
No Policy Change	1,910	1,530	1,780	2,230
Expanded Growth Policy	1,870	1,500	1,560	1,950
Controlled Growth Policy (18 Million)	1,935	1,540	1,925	2,405
Controlled Growth Policy (16 Million)	1,960	1,560	2,075	2,590
Reduced Activity Policy	1,990	1,575	2,245	2,810
Volume/Capacity Ratio				
No Policy Change	1.91	1.53	0.45	0.37
Expanded Growth Policy	1.87	1.50	0.39	0.33
Controlled Growth Policy (18 Million)	1.94	1.54	0.48	0.40
Controlled Growth Policy (16 Million)	1.96	1.56	0.52	0.43
Reduced Activity Policy	1.99	1.58	0.56	0.47
Level of Service				
No Policy Change	F	F	B	A
Expanded Growth Policy	F	F	B	A
Controlled Growth Policy (18 Million)	F	F	B	A
Controlled Growth Policy (16 Million)	F	F	C	B
Reduced Activity Policy	F	F	C	B

"A" to LOS "B" under this policy alternative. The segment of the Dulles Access Road west of Sully Road shows an increase in service level from "B" to "A" in 1990. Generally, levels of service A, B, and C are considered excellent peak period levels on major facilities.

The deterioration of both Sully Road segments (AR1 and AR2) from "C" to "F" conditions is a reflection of the general non-airport through-traffic increases anticipated for the highway. Recent studies have shown that Sully Road (Virginia Route 28) is projected to have a critical imbalance in demand versus capacity beyond 1985.[1] Thus, the need for upgrading Virginia Route 28 from U.S. 29-211 north to Virginia Route 7 has been recognized for an extended period of time. The improvement of Sully Road to a four-lane high-design facility is not programmed or funded at this time; therefore, for the purposes of this assessment it was assumed to remain a two-lane, undivided highway. The projected levels of service for AR1 and AR2 is "F" under all other policy options as a result of the through-traffic growth and unsatisfied demand in the corridor.

The increase in the level of service for AR4 is attributable to the addition of extra lanes west of Sully Road.

Expanded Growth Policy at National

The Expanded Growth at National alternative, which provides for up to approximately 6,700,000 total passengers at Dulles in the year 1990, is expected to increase daily airport-related vehicle flows by approximately 71 percent, or 18,000 vehicle trips (two-way) above those experienced in 1979.

Exhibit III-35 shows the projected airport and non-airport traffic volumes for the year 1990 under this alternative. Table III-28 provides a generalized review of calculated future levels of service for selected access roadway (AR) links based upon the volumes shown on Exhibit III-35. This table shows that, except for the deterioration of Sully Road due to through traffic growth, the overall levels of service on the Dulles Access Road (AR3 and AR4) are very high.

Controlled Growth Policy to 18 Million Passengers at National

This Controlled Growth at National alternative should result in approximately 10,200,000 annual passengers in 1990 at Dulles, which is expected to increase daily airport-related vehicle flows

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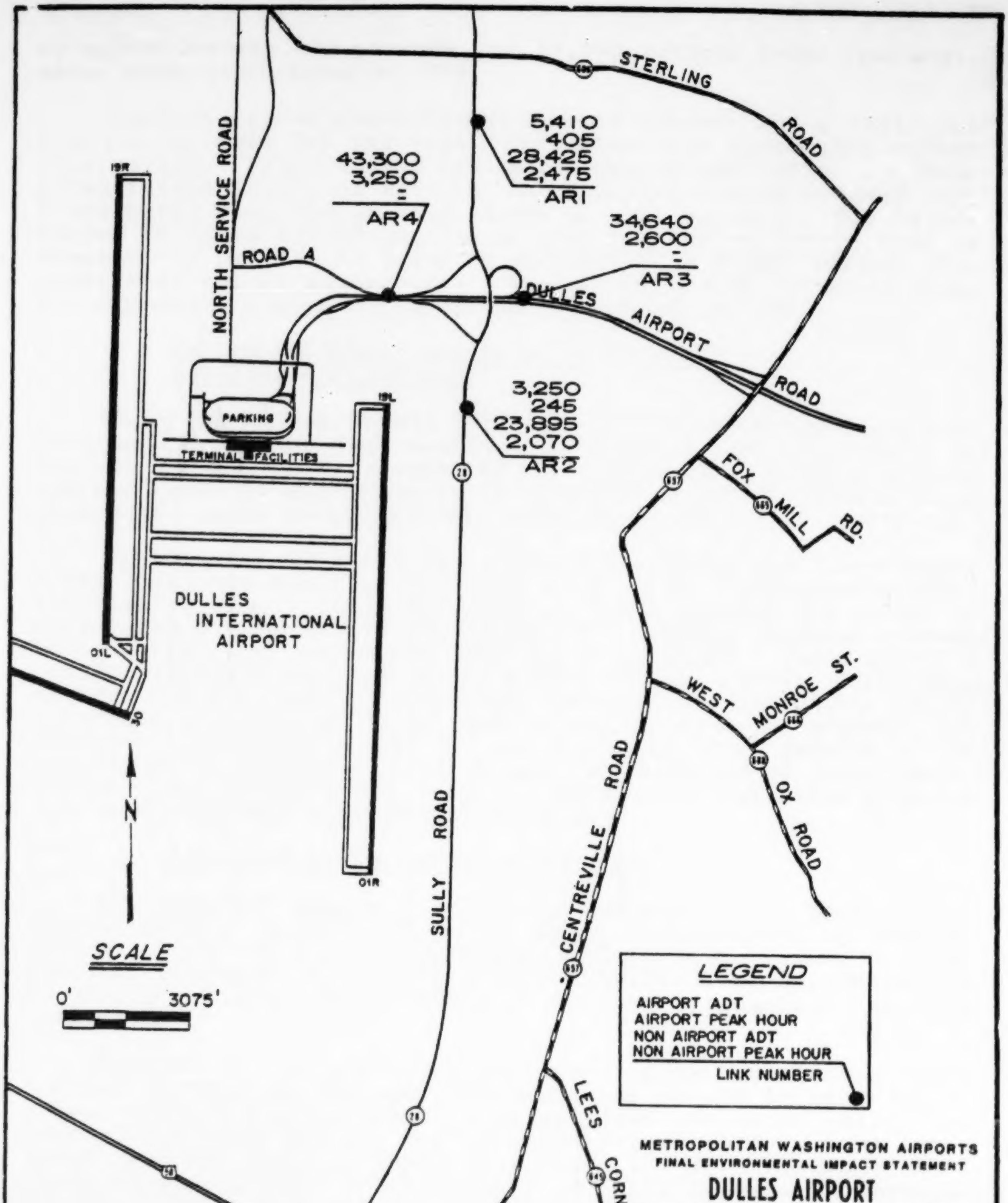
[1] Metropolitan Washington Council of Governments and National Capital Region Transportation Planning Board, Testing of Transportation Plan Alternatives, 1976.

-U.S. Department of Transportation, Federal Aviation Administration, and William L. Pereira Associates, Dulles Urban Center Concepts, 1973.

-Virginia Department of Highways and Transportation, and JHK and Associates, Dulles Toll Road Study, 1979.



STERLING ROAD
NORTH SERVICE ROAD
5,410
405
28,425
2,475
AR1
43,300
3,250
=
AR4
34,640
2,600
=
AR3
ROAD A
DULLES AIRPORT ROAD
3,250
245
23,895
2,070
AR2
PARKING
TERMINAL FACILITIES
19R
19L
01L
01R
30
28
657
FOX MILL RD.
DULLES INTERNATIONAL AIRPORT
WEST MONROE ST.
OX ROAD
CENTREVILLE ROAD
SULLY ROAD
N
SCALE
0'
3075'
LEGEND
AIRPORT ADT
AIRPORT PEAK HOUR
NON AIRPORT ADT
NON AIRPORT PEAK HOUR
LINK NUMBER
LEES CORNER ROAD
LEE ROAD

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

DULLES AIRPORT 1990 SURFACE TRAFFIC VOLUMES EXPANDED GROWTH AT NATIONAL

EXHIBIT III-35

by approximately 110 percent, or 28,000 vehicle trips (two-way), above those experienced in 1979.

Exhibit III-36 shows the projected airport and non-airport traffic volumes for the year 1990 under this Controlled Growth alternative. Table III-28 provides a generalized review of calculated future levels of service for selected access roadway (AR) links based upon the volumes shown on this exhibit. The information on Table III-28 indicates that the Dulles Access Road is expected to operate at level of service "B" or higher through 1990 under this policy alternative. The two Sully Road (Virginia Route 28) segments are expected to operate at LOS "F" in 1990.

Controlled Growth Policy to 16 Million Passengers at National

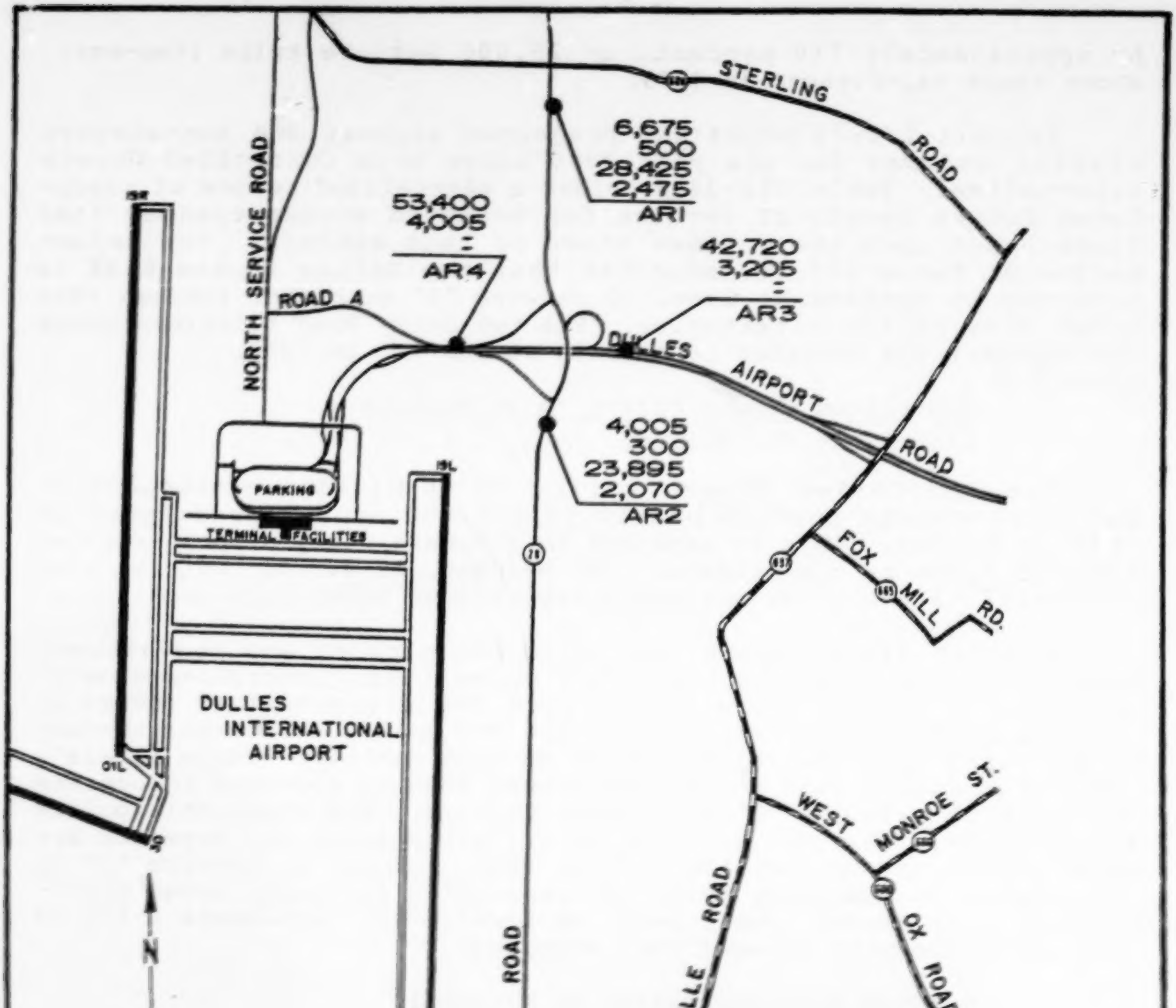
The Controlled Growth Policy to 16 Million passengers at National should produce nearly 11,400,000 annual passengers in 1990 at Dulles. This is expected to increase daily airport-related vehicle flows by approximately 127 percent, or 32,000 vehicle trips (two-way), above those currently experienced under 1979 conditions.

Exhibit III-37 shows the projected airport and non-airport traffic volumes for the year 1990 under this "Controlled Growth" alternative plan. Table III-28 provides a generalized review of calculated future levels of service for selected external roadway links based upon the volumes shown on this exhibit. Table III-28's results indicate that the Dulles Access Road is expected to operate at level of service "C" or higher through 1990 under this policy alternative. The two Sully Road (Virginia Route 28) segments are expected to operate at LOS "F" in 1990. Level of service "C" is considered an adequate level of service in developed urban corridors at peak travel times. Level of service "F" represents a forced flow condition with intermittent stoppages.

Reduced Activity Policy at National

The Reduced Activity Policy at National would provide for approximately 12,500,000 total annual passengers by 1990 at Dulles. This increase in passenger activity would result in a 146 percent increase in airport-related traffic, or approximately 37,000 additional daily two-way vehicle trips above the 1979 condition.

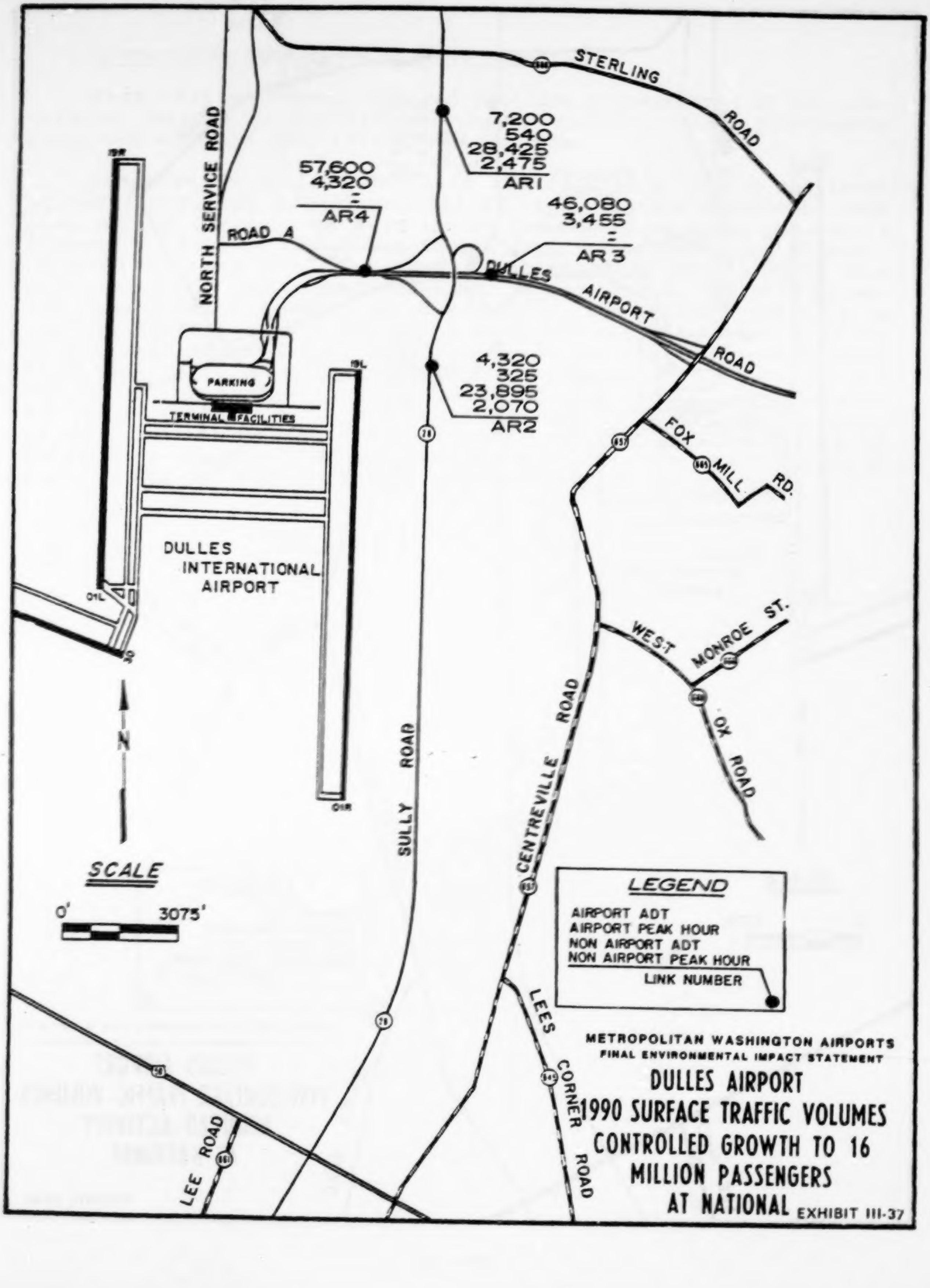
Exhibit III-38 shows the projected airport and non-airport traffic volumes for the year 1990 under the Reduced Activity Policy plan. Table III-28 provides a generalized review of calculated future levels of service for selected access roadway (AR) links based upon the volumes shown on Exhibit III-38. The table shows that, except for the deterioration of Sully Road due to through-traffic growth, the overall levels of service on the Dulles Access Road (AR3 and AR4) are LOS "C" or higher in 1990. As with all of the alternative policies under consideration, Sully Road is expected to operate at level of service "F" in 1990.


STERLING ROAD
6,675
500
28,425
2,475
AR1
53,400
4,005
=
AR4
42,720
3,205
=
AR3
NORTH SERVICE ROAD
ROAD A
DULLES AIRPORT ROAD
4,005
300
23,895
2,070
AR2
PARKING
TERMINAL FACILITIES
FOX MILL RD.
DULLES INTERNATIONAL AIRPORT
WEST MONROE ST.
OX ROAD
CENTREVILLE ROAD
SULLY ROAD
28
N
SCALE
0'
3075'
LEGEND
AIRPORT ADT
AIRPORT PEAK HOUR
NON AIRPORT ADT
NON AIRPORT PEAK HOUR
LINK NUMBER
LEES CORNER ROAD
LEE ROAD
50

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

**DULLES AIRPORT
1990 SURFACE TRAFFIC VOLUMES
CONTROLLED GROWTH TO 18
MILLION PASSENGERS
AT NATIONAL**

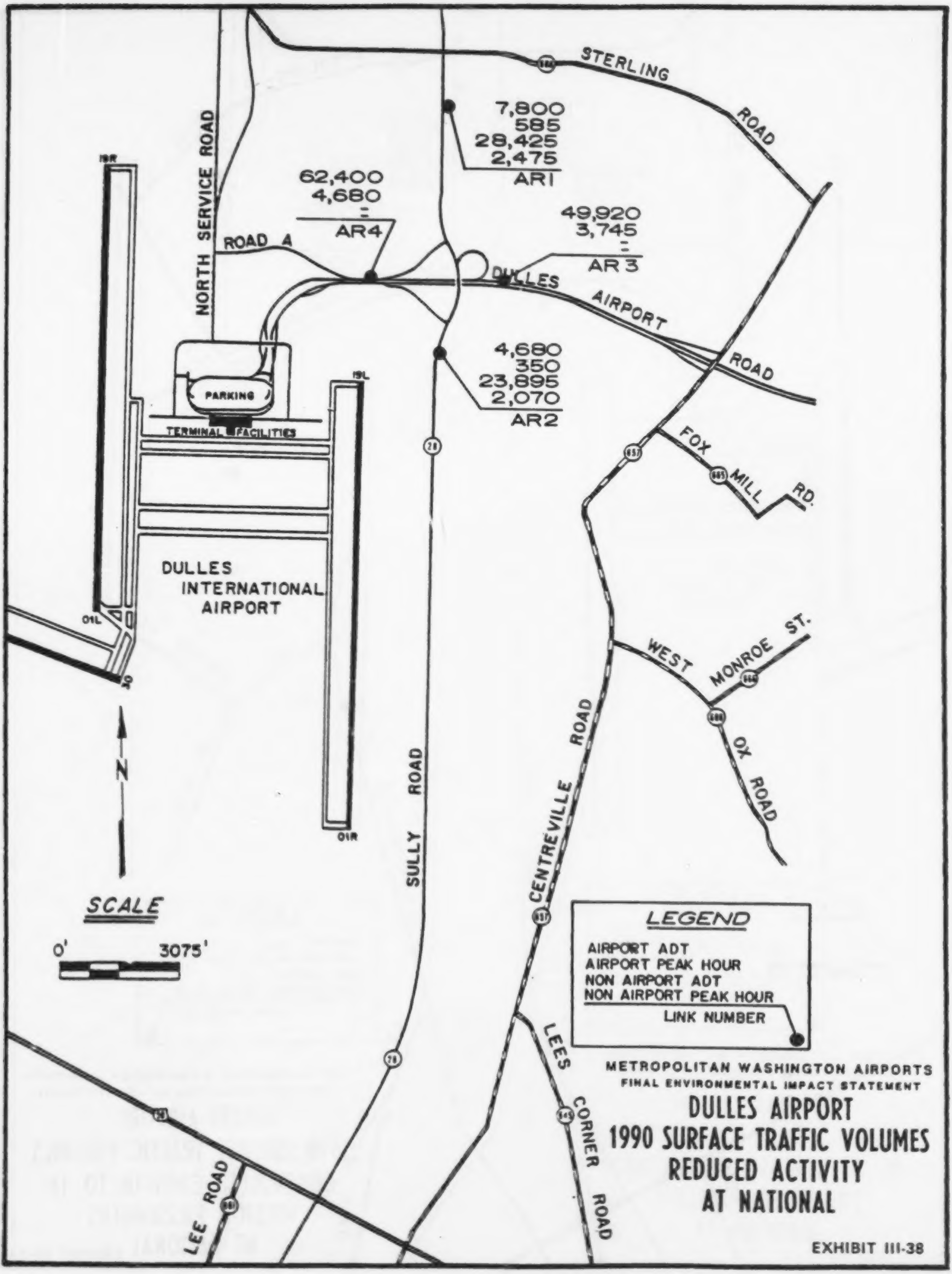
EXHIBIT III-36


STERLING ROAD
NORTH SERVICE ROAD
ROAD A
7,200
540
28,425
2,475
AR1
57,600
4,320
-
AR4
46,080
3,455
-
AR 3
DULLES AIRPORT ROAD
4,320
325
23,895
2,070
AR2
PARKING
TERMINAL FACILITIES
19R
19L
01L
01R
DULLES INTERNATIONAL AIRPORT
FOX MILL RD.
WEST MONROE ST.
OX ROAD
CENTREVILLE ROAD
SULLY ROAD
N
SCALE
0'
3075'
LEGEND
AIRPORT ADT
AIRPORT PEAK HOUR
NON AIRPORT ADT
NON AIRPORT PEAK HOUR
LINK NUMBER
LEES CORNER ROAD
LEE ROAD
28
657
665
606
50
645
661

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

DULLES AIRPORT 1990 SURFACE TRAFFIC VOLUMES CONTROLLED GROWTH TO 16 MILLION PASSENGERS AT NATIONAL

EXHIBIT III-37



STERLING ROAD
606
7,800
585
28,425
2,475
AR1
62,400
4,680
AR4
49,920
3,745
AR 3
NORTH SERVICE ROAD
ROAD A
DULLES AIRPORT ROAD
4,680
350
23,895
2,070
AR2
PARKING
TERMINAL FACILITIES
19R
19L
01L
01R
28
657
FOX MILL RD.
665
DULLES INTERNATIONAL AIRPORT
WEST MONROE ST.
666
608
OX ROAD
N
SULLY ROAD
CENTREVILLE ROAD
657
SCALE
0'
3075'
LEGEND
AIRPORT ADT
AIRPORT PEAK HOUR
NON AIRPORT ADT
NON AIRPORT PEAK HOUR
LINK NUMBER
LEES CORNER ROAD
645
28
50
LEE ROAD
661

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

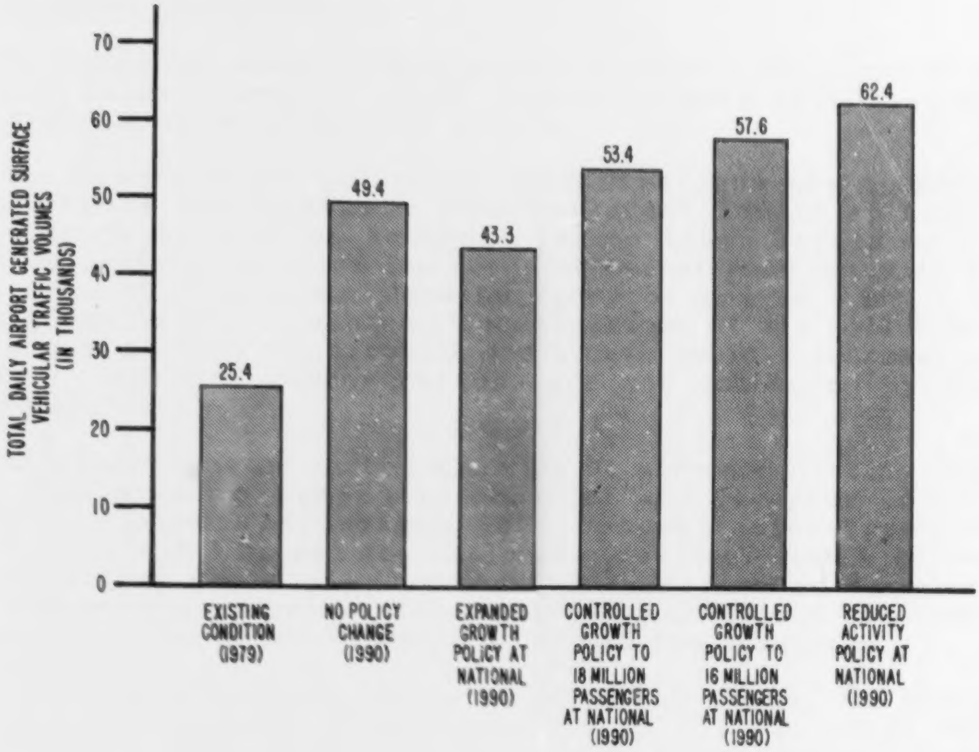
DULLES AIRPORT 1990 SURFACE TRAFFIC VOLUMES REDUCED ACTIVITY AT NATIONAL

EXHIBIT III-38

Comparative Summary of Traffic Impacts

This section summarizes and provides a comparison of the calculated impacts of the five alternative policy plans previously described with the 1979 existing conditions.

As shown on traffic Exhibits III-33 through III-38 and level of service Tables III-27 and III-28, the relative impacts of each plan varies directly in relation to the number of total passengers allowed. Exhibit III-39 provides a graphic comparison of airport-related surface traffic generation resulting from each of the policy options under consideration, in addition to the 1979 Existing Conditions. As seen on this exhibit, the greatest increase in surface traffic occurs at Dulles under the Reduced Activity Policy at National alternative, with nearly 12,600,000 annual passengers at Dulles. The least impacts would occur under the Expanded Growth Policy at National with only 7,700,000 total annual passengers at Dulles. Review of the two level of service tables shows that, except for the dramatic reduction of traffic service levels on Sully Road (access roadway links AR1 and AR2), the traffic impacts expected for the various policy alternatives are not severe.



METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

ALTERNATIVE SURFACE TRAFFIC COMPARISONS AT DULLES

EXHIBIT III-39

AIR QUALITY

Introduction and Methodology

The methodology and sources of information used as a basis for this air quality impact analyses can be found in the discussion of National Airport air quality.

Existing Conditions

In order to access the airport's impacts on surrounding air quality, nine receptor point locations were established. The locations are shown on Exhibit III-40.

The existing air pollutant concentrations are summarized in Table III-29 and indicate that pollutant levels at Dulles are generally lower than at National due to lower levels of airport activity and the relative low level of off-airport activity in this rural area of Virginia. On-site receptor points 1 and 2 exhibit the highest airport-related concentrations of all pollutants, due to their proximity to aircraft and access vehicle sources, respectively. Off-site concentrations are not dominated by airport-related activity.

No violations of carbon monoxide or nitrogen dioxide standards are calculated to presently occur at any receptor point. The airport-related hydrocarbon (HC) concentrations predicted at receptors 1 and 3 exceed the national guideline. Other hydrocarbon concentrations could also exceed the guideline as the result of high background values. The suspended particulate concentrations at receptor 1 are shown to equal or exceed the standards.

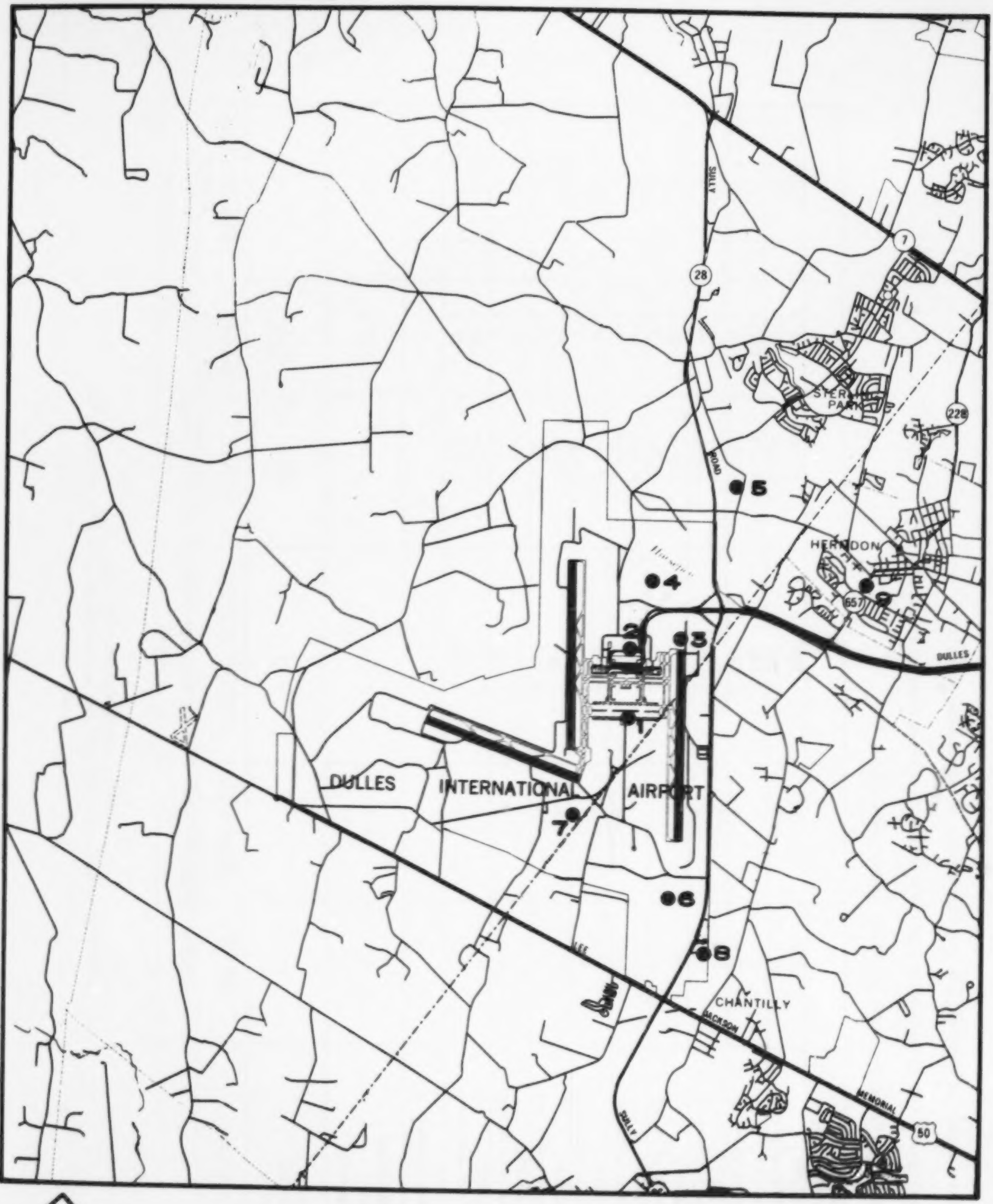
Aircraft emissions, in terms of total loads, indicated that 26,000 pounds per day presently occur at Dulles. This existing condition has been established to provide a baseline for comparison with alternative policy options. The airport-associated automobile traffic contribution was also examined and combined with the aircraft loadings to produce the total pollutant emissions presented in Table III-30.

Impacts of Policy Alternatives

A comparison of air quality impacts is provided in terms of both air pollutant concentrations and total emissions. Tables III-31 through III-35 provide information on pollutant concentrations resulting from the policy alternatives. As can be seen, the difference in air pollutant emissions is small. Although increases in passengers and resulting surface vehicles are anticipated by 1990, emission controls on automobiles will reduce the airport-related concentrations.

Comparative Summary of Air Quality Impacts

The total daily emissions generated by aircraft at Dulles


SULLY
28
7
STERLING PARK
228
ROAD
5
HERNDON
4
9
657
2
3
DULLES
1
DULLES INTERNATIONAL AIRPORT
7
6
8
LEE
CHANTILLY
JACKSON
MEMORIAL
SULLY
50

N

0' 4000' 8000'

LEGEND

● 2 RECEPTOR POINT

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

AIR QUALITY RECEPTOR POINTS
DULLES AIRPORT

EXHIBIT III-40

[illegible]

TABLE III-29

EXISTING (1979) MAXIMUM POLLUTANT CONCENTRATIONS IN VICINITY OF DULLES INTERNATIONAL AIRPORT

	CARBON MONOXIDE (ppm)		TOTAL HYDROCARBONS[3] (ppm)	NITROGEN DIOXIDE (ppm)	TOTAL SUSPENDED PARTICULATES ($\mu g/m^3$)	
AVERAGING TIME	ONE-HOUR	EIGHT-HOUR	6-9 A.M. AVERAGE	ANNUAL AVERAGE	24-HOUR AVERAGE	ANNUAL GEOMETRIC MEAN
FEDERAL AIR QUALITY STANDARD	35	9	0.24	0.05	260	75
NON-AIRPORT RELATED CONCENTATIONS	4.7	3.0	2.081	0.007	123.8	53.9
RECEPTOR POINT[1]						
1 Airport-Related	4.7	1.2	1.224	0.024	26.0	10.0
Total[2]	9.4	4.2	3.305	0.031	149.8	63.9
2 Airport-Related	10.0	3.9	0.180	0.021	8.5	1.5
Total[2]	14.7	6.9	2.261	0.028	132.3	55.4
3 Airport-Related	1.6	0.9	0.273	0.021	10.5	2.1
Total[2]	6.3	3.9	2.354	0.028	134.3	56.0
4 Airport-Related	1.8	0.9	0.135	0.005	2.7	0.7
Total[2]	6.5	3.9	2.216	0.012	126.5	54.6
5 Airport-Related	0.2	0.3	0.019	0.001	0.5	0.1
Total[2]	4.9	3.3	2.100	0.008	124.3	54.0
6 Airport-Related	0.5	0.2	0.133	0.007	4.5	0.7
Total[2]	5.2	3.2	2.214	0.014	128.3	54.6
7 Airport-Related	0.7	0.4	0.116	0.009	3.6	0.7
Total[2]	5.4	3.4	2.197	0.016	127.4	54.6
8 Airport-Related	0.4	0.2	0.118	0.004	2.0	0.6
Total[2]	5.1	3.2	2.199	0.011	125.8	54.5
9 Airport-Related	0.1	0.01	0.023	0.001	0.2	0.1
Total[2]	4.8	3.01	2.104	0.008	124.0	54.0
10 Airport-Related						
Total[2]						

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[1] See Exhibit III-40 for receptor point locations.

[2] See Table B-2 in Appendix B for non-airport-related concentrations.

[3] This value is a guideline for attainment of the ozone standard.

TABLE III-30

EMISSION INVENTORY FOR DULLES AIRPORT[a]
(pounds per day)

	PARTICULATES	SULFUR OXIDES	CARBON MONOXIDE	HYDROCARBONS	NITROGEN OXIDES	TOTAL
Existing (1979)	1,040	715	76,524	13,582	9,316	101,176
No Policy Change at National	1,884	1,192	64,988	11,373	11,712	91,148
Expanded Growth Policy at National	1,947	1,191	66,621	11,364	11,664	92,788
Controlled Growth Policy to 18 Million at National	2,029	1,301	69,469	12,005	14,348	99,151
Controlled Growth Policy to 16 Million at National	2,203	1,421	74,896	12,943	14,136	105,600
Reduced Activity Policy at National	2,404	1,556	81,113	14,116	15,373	114,562

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[a] Includes emissions from aircraft and airport-related traffic.

TABLE III-31
PROJECTED (1990) MAXIMUM POLLUTANT CONCENTRATIONS IN VICINITY OF DULLES INTERNATIONAL AIRPORT
(No Policy Change at National)

	CARBON MONOXIDE (ppm)		TOTAL HYDROCARBONS^3 (ppm)	NITROGEN DIOXIDE (ppm)	TOTAL SUSPENDED PARTICULATES ($\mu g/m^3$)	
AVERAGING TIME	ONE-HOUR	EIGHT-HOUR	6-9 A.M. AVERAGE	ANNUAL AVERAGE	24-HOUR AVERAGE	ANNUAL GEOMETRIC MEAN
FEDERAL AIR QUALITY STANDARD	35	9	0.24	0.05	260	75
NON-AIRPORT RELATED CONCENTATIONS	2.9	1.8	1.85	0.007	115	50
RECEPTOR POINT[1]						
1 Airport-Related	4.1	1.2	0.394	0.061	29.7	6.2
Total[2]	7.0	3.0	2.244	0.068	144.7	56.2
2 Airport-Related	2.8	1.6	0.174	0.012	9.8	2.1
Total[2]	5.7	3.4	2.024	0.019	124.8	52.1
3 Airport-Related	2.7	1.2	0.193	0.015	16.2	3.8
Total[2]	5.6	3.0	2.043	0.022	131.2	53.8
4 Airport-Related	1.4	0.6	0.094	0.005	2.6	0.6
Total[2]	4.3	2.4	1.944	0.012	117.6	50.6
5 Airport-Related	0.2	0.2	0.013	0.003	1.0	2.2
Total[2]	3.1	2.0	1.863	0.010	116.0	52.2
6 Airport-Related	0.5	0.3	0.038	0.008	4.9	1.1
Total[2]	3.4	2.1	1.888	0.015	119.9	51.1
7 Airport-Related	0.8	0.5	0.152	0.011	5.3	1.4
Total[2]	3.7	2.3	2.002	0.018	120.3	51.4
8 Airport-Related	0.4	0.2	0.033	0.004	2.4	0.5
Total[2]	3.3	2.0	1.883	0.011	117.4	50.5
9 Airport-Related	0.1	0.03	0.009	0.0006	0.2	0.05
Total[2]	3.0	1.83	1.859	0.0013	115.2	50.05
10 Airport-Related						
Total[2]						

[1] See Exhibit III-40 for receptor point locations.

[2] See Table B-2 in Appendix B for non-airport-related concentrations.

[3] This value is a guideline for attainment of the ozone standard.

TABLE III-32

PROJECTED (1990) MAXIMUM POLLUTANT CONCENTRATIONS IN VICINITY OF DULLES INTERNATIONAL AIRPORT

(Expanded Growth Policy at National)

	CARBON MONOXIDE (ppm)		TOTAL HYDROCARBONS^3(ppm)	NITROGEN DIOXIDE (ppm)	TOTAL SUSPENDED PARTICULATES (μg/m^3)	
AVERAGING TIME	ONE-HOUR	EIGHT-HOUR	6-9 A.M. AVERAGE	ANNUAL AVERAGE	24-HOUR AVERAGE	ANNUAL GEOMETRIC MEAN
FEDERAL AIR QUALITY STANDARD	35	9	0.24	0.05	260	75
NON-AIRPORT RELATEL CONCENTATIONS	2.9	1.8	1.85	0.007	115	50
RECEPTOR POINT[1]						
1 Airport-Related	4.0	1.1	0.385	0.055	26.9	5.7
Total[2]	6.9	2.9	2.235	0.062	141.9	55.7
2 Airport-Related	2.5	1.4	0.169	0.011	9.0	1.9
Total[2]	5.4	3.2	2.019	0.018	124.0	51.9
3 Airport-Related	2.6	1.2	0.188	0.014	14.5	3.4
Total[2]	5.5	3.0	2.038	0.021	129.5	53.4
4 Airport-Related	1.2	0.6	0.088	0.005	2.4	0.5
Total[2]	4.1	2.4	1.938	0.012	117.4	50.5
5 Airport-Related	0.2	0.2	0.012	0.003	0.9	2.0
Total[2]	3.1	2.0	1.862	0.010	115.9	52.0
6 Airport-Related	0.5	0.2	0.037	0.007	4.5	1.0
Total[2]	3.4	2.0	1.887	0.014	119.5	51.0
7 Airport-Related	0.7	0.5	0.149	0.010	5.1	1.3
Total[2]	3.6	2.3	1.999	0.017	120.1	51.3
8 Airport-Related	0.4	0.2	0.033	0.004	2.2	0.4
Total[2]	3.3	2.0	1.883	0.011	117.2	50.4
9 Airport-Related	0.1	0.03	0.009	0.0005	0.2	0.04
Total[2]	3.0	1.83	1.859	0.0075	115.2	50.04
10 Airport-Related						
Total[2]						

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[1] See Exhibit III-40 for receptor point locations.

[2] See Table B-2 in Appendix B for non-airport-related concentrations.

[3] This value is a guideline for attainment of the ozone standard.

TABLE III-33

PROJECTED (1990) MAXIMUM POLLUTANT CONCENTRATIONS IN VICINITY OF DULLES INTERNATIONAL AIRPORT

(Controlled Growth Policy to 18 Million Passengers at National)

	CARBON MONOXIDE (ppm)		TOTAL HYDROCARBONS[3] (ppm)	NITROGEN DIOXIDE (ppm)	TOTAL SUSPENDED PARTICULATES ($\mu g/m^3$)	
AVERAGING TIME	ONE-HOUR	EIGHT-HOUR	6-9 A.M. AVERAGE	ANNUAL AVERAGE	24-HOUR AVERAGE	ANNUAL GEOMETRIC MEAN
FEDERAL AIR QUALITY STANDARD	35	9	0.24	0.05	260	75
NON-AIRPORT RELATED CONCENTATIONS	2.9	1.8	1.85	0.007	115	50
RECEPTOR POINT[1]						
1 Airport-Related	4.3	1.2	0.420	0.066	32.0	6.6
Total[2]	7.2	3.0	2.270	0.073	147.0	56.6
2 Airport-Related	3.0	4.9	0.185	0.030	10.5	2.2
Total[2]	5.9	6.7	2.035	0.037	125.5	52.2
3 Airport-Related	2.9	1.3	0.205	0.017	17.4	4.1
Total[2]	5.8	3.1	2.055	0.024	132.4	54.1
4 Airport-Related	1.5	0.7	0.189	0.006	2.9	0.6
Total[2]	4.4	2.5	2.039	0.013	117.9	50.6
5 Airport-Related	0.2	0.2	0.014	0.003	1.1	2.4
Total[2]	3.1	2.0	1.864	0.010	116.1	52.4
6 Airport-Related	0.5	0.3	0.040	0.008	5.3	1.1
Total[2]	3.4	2.1	1.890	0.015	120.3	51.1
7 Airport-Related	0.8	0.6	0.162	0.010	5.7	1.5
Total[2]	3.7	2.4	2.012	0.017	120.7	51.5
8 Airport-Related	0.4	0.2	0.036	0.005	2.6	0.5
Total[2]	3.3	2.0	1.886	0.012	117.6	50.5
9 Airport-Related	0.1	0.03	0.010	0.0006	0.2	0.05
Total[2]	3.0	1.83	1.860	0.0076	115.2	50.05
10 Airport-Related						
Total[2]						

[1] See Exhibit III-40 for receptor point locations.

[2] See Table B-2 in Appendix B for non-airport-related concentrations.

[3] This value is a guideline for attainment of the ozone standard.

TABLE III-34

PROJECTED (1990) MAXIMUM POLLUTANT CONCENTRATIONS IN VICINITY OF DULLES INTERNATIONAL AIRPORT
(Controlled Growth Policy to 16 Million Passengers at National)

	CARBON MONOXIDE (ppm)		TOTAL HYDROCARBONS[3] (ppm)	NITROGEN DIOXIDE (ppm)	TOTAL SUSPENDED PARTICULATES (μg/m^3)	
AVERAGING TIME	ONE-HOUR	EIGHT-HOUR	6-9 A.M. AVERAGE	ANNUAL AVERAGE	24-HOUR AVERAGE	ANNUAL GEOMETRIC MEAN
FEDERAL AIR QUALITY STANDARD	35	9	0.24	0.05	260	75
NON-AIRPORT RELATED CONCENTATIONS	2.9	1.8	1.85	0.007	115	50
RECEPTOR POINT[1]						
1 Airport-Related	4.5	1.3	0.438	0.071	34.1	7.1
Total[2]	7.4	3.1	2.288	0.078	149.1	57.1
2 Airport-Related	3.3	1.9	0.193	0.013	11.1	2.4
Total[2]	6.2	3.7	2.043	0.020	126.1	52.4
3 Airport-Related	3.0	1.3	0.214	0.018	18.6	4.4
Total[2]	5.9	3.1	2.064	0.025	133.6	54.4
4 Airport-Related	1.6	0.7	0.106	0.006	3.1	0.7
Total[2]	4.5	2.5	1.956	0.013	118.1	50.7
5 Airport-Related	0.2	0.2	0.015	0.002	1.1	2.5
Total[2]	3.1	2.0	1.865	0.009	116.1	52.5
6 Airport-Related	0.6	0.3	0.042	0.009	5.6	1.2
Total[2]	3.5	2.1	1.892	0.016	120.6	51.2
7 Airport-Related	0.9	0.6	0.169	0.010	6.0	1.5
Total[2]	3.8	2.4	2.019	0.017	121.0	51.5
8 Airport-Related	0.5	0.3	0.037	0.005	2.8	0.5
Total[2]	3.4	2.1	1.887	0.012	117.8	50.5
9 Airport-Related	0.09	0.04	0.010	0.0006	0.3	0.05
Total[2]	3.0	1.84	1.860	0.0076	115.3	50.05
10 Airport-Related						
Total[2]						

---

[1] See Exhibit III-40 for receptor point locations.

[2] See Table B-2 in Appendix B for non-airport-related concentrations.

[3] This value is a guideline for attainment of the ozone standard.

TABLE III-35

PROJECTED (1990) MAXIMUM POLLUTANT CONCENTRATIONS IN VICINITY OF
DULLES INTERNATIONAL AIRPORT
(Reduced Activity Policy at National)

	CARBON MONOXIDE (ppm)		TOTAL HYDROCARBONS[3] (ppm)	NITROGEN DIOXIDE (ppm)	TOTAL SUSPENDED PARTICULATES ($\mu g/m^3$)	
AVERAGING TIME	ONE-HOUR	EIGHT-HOUR	6-9 A.M. AVERAGE	ANNUAL AVERAGE	24-HOUR AVERAGE	ANNUAL GEOMETRIC MEAN
FEDERAL AIR QUALITY STANDARD	35	9	0.24	0.05	260	75
NON-AIRPORT RELATED CONCENTATIONS	2.9	1.8	1.85	0.007	115	50
RECEPTOR POINT[1]						
1 Airport-Related	4.7	1.3	0.456	0.076	36.6	7.6
Total[2]	7.6	3.1	2.306	0.083	151.6	57.6
2 Airport-Related	3.5	2.0	0.201	0.014	11.8	2.5
Total[2]	6.4	3.8	2.051	0.021	126.8	52.5
3 Airport-Related	3.1	1.4	0.223	0.019	20.0	4.7
Total[2]	6.0	3.2	2.073	0.026	135.0	54.7
4 Airport-Related	1.7	0.8	0.112	0.007	3.3	0.7
Total[2]	4.6	2.6	1.962	0.014	118.3	50.7
5 Airport-Related	0.2	0.3	0.015	0.004	1.2	2.7
Total[2]	3.1	2.1	1.865	0.011	116.2	52.7
6 Airport-Related	0.6	0.3	0.044	0.009	6.0	1.3
Total[2]	3.5	2.1	1.894	0.016	121.0	51.3
7 Airport-Related	0.9	0.6	0.176	0.013	6.3	1.6
Total[2]	3.8	2.4	2.026	0.020	121.3	51.6
8 Airport-Related	0.5	0.3	0.039	0.006	3.0	0.6
Total[2]	3.4	2.1	1.889	0.013	118.0	50.6
9 Airport-Related	0.1	0.04	0.010	0.0008	0.3	0.06
Total[2]	3.0	1.84	1.860	0.0078	115.3	50.06
10 Airport-Related						
Total[2]						

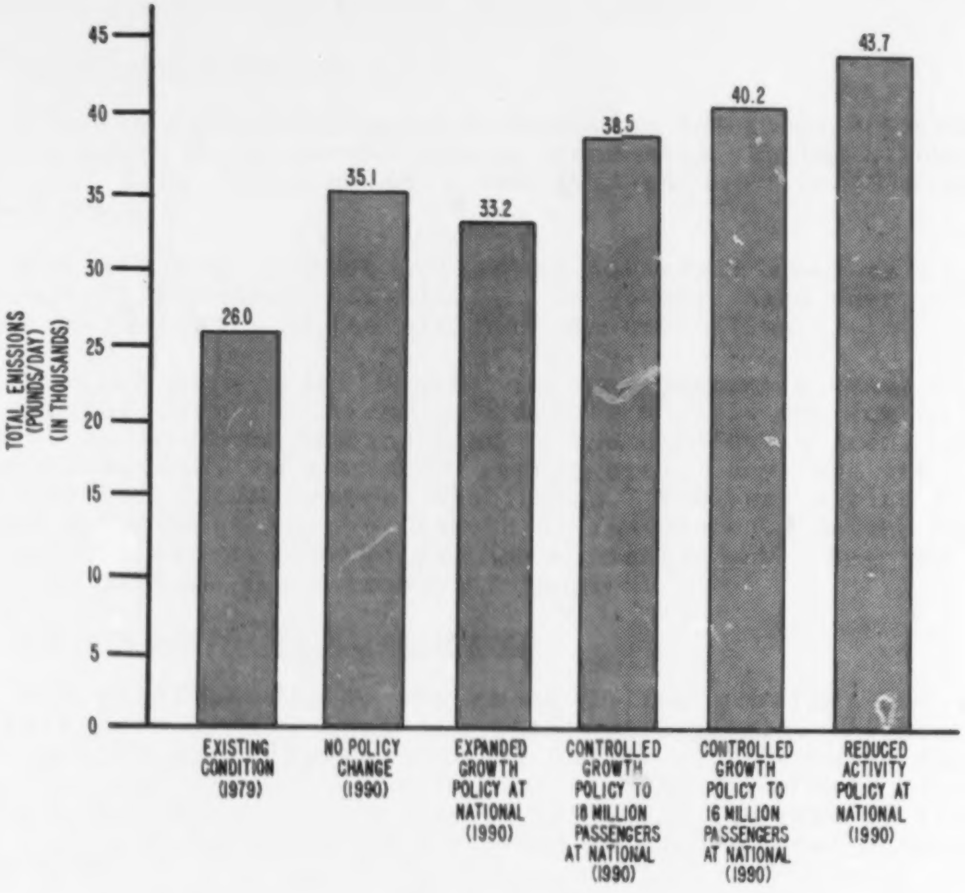
[1] See Exhibit III-40 for receptor point locations.

[2] See Table B-2 in Appendix B for non-airport-related concentrations.

[3] This value is a guideline for attainment of the ozone standard.

were calculated for each alternative and are presented on Exhibit III-41. The Reduced Activity Policy at National results in the largest aircraft emission loadings, whereas the Expanded Growth Policy at National yields the smallest aircraft emissions.

Table III-30 presents the total of airport-associated traffic and aircraft activity emissions at Dulles. As was the case with National Airport, no single alternative is significantly better from an air quality standpoint than the other alternatives. The Expanded Growth Policy at National yields the lowest concentrations in the immediate vicinity of Dulles. This is due to the aircraft, and hence, the automobile traffic, being more concentrated at National than at Dulles.



METROPOLITAN WASHINGTON AIRPORTS

FINAL ENVIRONMENTAL IMPACT STATEMENT

TOTAL DAILY AIRCRAFT POLLUTANT EMISSIONS AT DULLES

EXHIBIT III-41

ENERGY

Introduction and Methodology

The methodology and regional data for energy usage is presented in the National Airport Energy section.

Existing Conditions

Present electrical power consumption has risen approximately 7 percent over three recent years, from 46.5 million kilowatt hours in fiscal year 1975, to 46.9 and 49.1 million in 1976 and 1977, respectively.

The aircraft mix at Dulles is not restricted as to type of aircraft. Therefore, flexibility in establishing energy-efficient routes is available to the airlines who use Dulles.

Limited mass transit alternatives presently exist at Dulles. Bus service from the airport provides shuttle service to National as well as to other destinations in the Washington area. The drawbacks of Dulles, in terms of energy efficiency, are its more distant location from central Washington. However, during the review of the Supplement to the Draft EIS, improvements in the rapid rail connecting service to Dulles were identified. See the Surface Access subsection for further information.

Impacts of Policy Alternatives

The parallel runway system at Dulles provides for substantially more capacity than the National airfield. Although alternatives that shift operations to Dulles will increase delay time, these delays should be mitigated by the available capacity at Dulles. Surface vehicular energy usage was analyzed by alternative on a regional basis and is contained in the National Airport Energy subsection.

It is anticipated that increases will occur in energy consumption resulting from expansion of the Dulles terminal building. The exact amount of this energy requirement cannot be estimated until expansion plans are finalized.

SOCIAL AND ECONOMIC CONDITIONS

Introduction and Methodology

The paramters involved in evaluating the primary and secondary socioeconomic effects of the various policy alternatives were discussed previously in the National Airport Social and Economic Conditions section of this report. In addition, a detailed discussion of the social and economic impacts of the alternatives is contained in a companion document to this FEIS entitled, "Economic Report/Urban and Community Impact Analysis." The reader is referred to this other document for further information.

Existing Conditions

Almost 3,000 persons with an average salary of $17,300 are now employed full-time at Dulles.[1] The full-time payroll is approximately $51,900,000.

Concession revenues and landing fees also contribute to the local economy. Approximately $41.3 million was spent in passenger-related purchases at the airport in 1979, with a payment to Metropolitan Washington Airports (MWA) of $5.9 million. Per passenger concession expenditures are greater at Dulles than at National[2] due to the long-haul, international nature of airline operations at Dulles. Expenditures by international passengers at the Dulles duty-free shop, of which there is no equivalent at National, account for a majority of the increased expenditures.

One additional direct economic impact of the operation of Dulles is the collection of landing fees. Approximately $1.9 million was paid to MWA in 1979 to defray the costs of maintenance and upkeep of the airfield. This total does not include the percentage of fees retained by the fixed base operator from general aviation landings. This proportion further serves to stimulate the spending for materials and labor that results from payments made to MWA.

Full-time employee payrolls, concession revenues, and landing fees thus contribute $95.1 million to the area, and serve to stimulate additional spending in the area for employee goods and services. Including this recycling effect, Dulles contributes about $190.2 million annually to the area.

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[1] Metropolitan Washington Airports records.

[2] In 1979, per passenger concession expenditures at Dulles averaged $12.64. Expenditures at National were estimated at $5.78 per passenger.

Secondary impacts of Dulles are similar to those described for National. These benefits of increased employment, subsequent expenditures, and increases in the local tax base are not included in the preceeding consideration of the contribution of Dulles to the local economy.

Impacts of Policy Alternatives

Table III-36 shows the comparative economic impacts of the policy alternatives at Dulles. In addition, Exhibit III-22 showed existing 1980 and projected 1990 employment at the airport under each alternative.

As evidenced by this information, all alternatives will result in increased employment, payroll, concession revenue and payment, and landing fees at Dulles. The magnitude of these increases varies significantly with alternative. As most of the indices are based on passenger growth, the Reduced Activity Policy at National would yield the greatest positive economic impacts at Dulles, and the Expanded Growth Policy at National would be expected to yield the smallest contribution to the airport and its environs.

Because of the high portion of minority employees at Dulles, the limited employment growth there will affect employment opportunities for women and minorities more than it will affect nonminorities.

In general, a 1978 FAA report found that 31.6 percent of air carrier jobs were held by minorities and women.[1] The same report found that 70 percent of all employees of the tenants and concessionaires at Dulles were minorities (including women).

The airport owner, Metropolitan Washington Airports, has an employee population of 32 percent minorities (including women).[2] Travel-related industries (hotels/motels and restaurants) have also employed high proportions (50.2 percent) of minority and women workers.[3] Thus, the increase in air travel resulting for the

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[1] U.S. Department of Transportation, Federal Aviation Administration. Review of Minority Participation on Airports Receiving Grant Assistance Under the Airport and Airway Development Act of 1970, July 1978, Appendix K, pp. 5-6.

[2] Ibid., pp. 18-19.

[3] U.S. Equal Employment Opportunity Commission, Equal Employment Opportunity Report 1975: Job Patterns for Minorities and Women in Private Industry, Volume I, pp. 111, 125.

TABLE III-36

COMPARATIVE ECONOMIC IMPACTS OF ALTERNATIVE POLICIES
DULLES INTERNATIONAL AIRPORT

	FULL-TIME EMPLOYMENT	EMPLOYEE PAYROLL[a]	CONCESSION REVENUE[a]	CONCESSION PAYMENT[a]	LANDING FEES[a]
Existing Conditions	3,000	$ 51.9	$ 41.3	$ 6.0	$ 2.0
No Policy Change	4,350	$ 75.2	$ 97.8	$ 14.1	$ 4.7
Expanded Growth Policy at National	4,030	$ 69.7	$ 84.6	$ 12.2	$ 4.3
Controlled Growth Policy to 18 Million Passengers at National	4,560	$ 78.9	$106.5	$ 15.4	$ 5.1
Controlled Growth Policy to 16 Million Passengers at National	4,780	$ 82.7	$115.7	$ 16.7	$ 5.8
Reduced Activity Policy at National	5,030	$ 87.0	$126.1	$ 18.3	$ 6.4

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[a] In millions of 1980 dollars.

various policy alternatives is expected to affect both direct and indirect airport employment of minorities at Dulles.

Employee growth at Dulles that results from the passenger limitation at National may induce a shift of employee residences to the Virginia suburbs near Dulles. This potential shift of residences will subsequently impact the areas in which employee purchases are made; these new purchases in the Dulles area would partially replace spending growth (for new employees) in the immediate vicinity of National.

AIRLINE SERVICE

Introduction and Methodology

A description of the factors which effect airline service and of the general study methodology can be found in the introduction to the Airline Service Subsection under National Airport.

Existing Conditions

Dulles is the primary long-haul airport for the region. As the newest of the three regional airports, and as the airport furthest from the densest population centers, its traffic characteristics are quite different from those at National and Baltimore-Washington. Transfer percentages are quite low, at approximately 7 percent.[1] It is primarily an origin/destination airport. Because of this, when national economic conditions worsen, and airlines are forced to reduce their network-wide schedules, cutbacks in service are more likely to occur here than at National or Baltimore-Washington. This in part is reflected in Tables III-18 and III-20 which showed that Dulles has lost nearly 40 percent of its flights in the past year. However, a major portion of this service loss also occurred when some of the airlines at Dulles removed less fuel efficient aircraft from their fleets that were not replaced.

The nonstop perimeter agreement at National was established in an effort to enhance the role of Dulles as the region's long-haul airport. This is, in fact, the case as Dulles traditionally has had more long-haul nonstops than Baltimore-Washington, and since it is the region's primary international airport.

Maintaining a perimeter at National (either the present agreement or a perimeter of 1,000 miles) is expected to maintain the role Dulles plays in the region's air transportation system. Elimination of the perimeter is not considered realistic as it would most likely result in a loss of nearly 37 of the approximately 86 nonstop domestic flights per day (or a 43 percent immediate daily flight reduction) at Dulles.[2] (See Table III-37.)

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[1] Averaged from information contained in the Dulles International Airport Access Study, by Howard, Needles, Tammen and Bergendoff, June 1978, p. 11, which indicated 6% transfers on Tuesdays and 8% transfers on Sundays.

[2] The most likely cities affected would be: Denver (10 flights), Dallas/Ft. Worth (9 flights), New York (2 flights which connect to Dallas/Ft. Worth), New Orleans (2 flights), Tulsa (2 flights), Austin (2 flights), Houston (6 flights), Salt Lake City (2 flights) and Kansas City (2 flights). Cities further away than Denver were not considered here because it was determined that, because of the short runway at National (6870 feet), the approximate maximum range for a B-727-200 from National would be 1,500 miles. The maximum range for the two and three-engine widebodies permitted to use the airport under the several policy alternatives is around 2,000 miles. Calculations for both aircraft categories

TABLE III-37

AVERAGE DAILY NONSTOP DOMESTIC SCHEDULES
DULLES INTERNATIONAL AIRPORT

High Density Markets	July 1980	December 1979	July 1979	October 1978	October 1973
New York					
La Guardia	4	6	10	10	14
Kennedy	9.3	13	14	17.6	17
Newark	0.1	4	8	9	6
TOTAL NEW YORK CITY	13.4	23	32	36.6	37
Los Angeles	11	11	18	12.7	12
Denver	10	12	14	8	10
Dallas	8.7	10	10	9	15
Philadelphia	3	3	8	6	8
San Francisco	6	6	10	6	8
TOTAL HIGH DENSITY MARKETS (includes New York City)	52.1	65	92	78.3	90
Medium and Low Density Markets					
Richmond	0	0	3	4	4
Norfolk	0	2	4	2	0
Boston	2	2	4	0.6	4
Detroit	2	2	4	3.8	0
Champaign, IL	0	0	4	4	4
Columbus, GA	0	0	0	4	6
Chicago	1	1	1	1	2
Miami	0.4	0.4	0.4	0.3	0
New Orleans	2	2	2	2	2
Tulsa	2	2	2	4	2
Houston	6	8	8	4	4
Austin	1.7	2	2	2	2
Phoenix	2	2	4	4	4
San Diego	2	2	4	4	4
Seattle	2	4	4	4	2
Atlanta	6	6	8	2	2
Greensville, SC	0	0	0	2	0
Salt Lake City	2	0	2	2	0
Kansas City	2	4	4	0	2
Peoria	0	0	0	0	2
Cleveland	0	0	0	0	1
Dayton	0	0	0	0	4
Columbus	0	0	0	0	2
Staunton	0	0	0	0	3
Kinston	0	0	0	0	2
Hartford	0	0	2	0	1
Baltimore	1	0	0	0	0
TOTAL MEDIUM AND LOW DENSITY MARKETS	34.1	39.4	62.4	49.7	59
TOTAL NONSTOPS	86.2	104.4	154.4	128	149

SOURCES; July 1979, December 1979, and July 1980 data: Official Airline Guide; October 1973 and October 1978 data: Metropolitan Washington Airports records.

This dramatic shift in long-haul flights from Dulles to National would, in all liklihood, force a nearly equivalent number of shorter air carrier flights to be discontinued at National due to hourly slot limits. These flights would most likely be those on the lower-density routes from (or to) cities within 650 miles of the region, and would be expected to transfer to Baltimore-Washington rather than to Dulles because of the higher levels of service (particularly scheduling frequencies) at the Maryland airport.[1] Such a transfer could be accomplished with relatively little difficulty in the deregulated environment in which the airline industry presently operates. For example, in late 1979, Ozark Airlines transferred its station from Dulles to Baltimore-Washington. Delta Air Lines and Piedmont Aviation have also recently closed their stations at Dulles but have not as yet increased service to Baltimore-Washington.

The result of elimination of the perimeter would be very detrimental for Dulles. This was poignantly illustrated in Table III-37 which showed how dramatically flights have left Dulles over the past few years as a result of the current poor economic climate. To date there has been an annual reduction in domestic flights of 54 percent from July 1979 to July 1980.

Elimination of the perimeter would leave only Seattle, Los Angeles, San Francisco, and San Diego as the primary domestic activity at Dulles. Should any of the carriers move this remaining service to Baltimore to combine it with existing activity at that airport in the interest of reducing costs, Dulles would lose all its domestic traffic until the mid or late 1980s depending on the restrictions placed on National. This would be a most serious and unexceptable outcome for the Washington-Baltimore region.

Dulles has historically been unrestricted and open for continuous 24-hour service. No policy proposal would change this operating arrangement.

Approximately 10 percent of the scheduled activity at Dulles presently occurs between the hours of 10:00 p.m. and 7:00 a.m.[2]

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were based on a mean maximum temperature of 88.2°F and assumed 90% load factors. However, there would always be the potential to fly nonstop from the West Coast and land at National with return service stopping once for fuel.

[1] Busy airports tend to experience greater percentages of increased traffic than do less busy airports.

[2] U.S. Department of Transportation, Federal Aviation Administration, Profiles of Scheduled Operations by Hour - Friday August 4, 1978, p. 294.

Impacts of Policy Alternatives

No Policy Change

As this alternative would maintain the existing nonstop perimeter, scheduling hours, and all other elements of the existing operating policy at National, the effects on Dulles should be minimal.

During the course of the present economic recession, traffic may decrease still further over that which has occurred over the past year. Over the long-term, however, it is anticipated that the long-haul routes at Dulles will continue to be strong, especially if flights lost because of the removal of less fuel efficient aircraft are replaced.

The airport should continue to grow in percentage of regional passengers especially as a natural ceiling is reached at National when the allowable slots become saturated.

Expanded Growth Policy at National

This alternative would establish a nonstop perimeter for National of 1,000 miles. The cities within this mileage band likely to lose some nonstop service from Dulles are New Orleans and Kansas City with a total of 4 nonstops per day. While Fort Lauderdale and Birmingham could be candidates to gain nonstop service from National, they are not presently served nonstop from Dulles.

Although no curfew would be imposed at National, the present 10:00 p.m. scheduling "hour" would be eliminated. Presently, approximately 20 flights are scheduled at National in the 10:00 p.m. minute. These 20 flights would have to be eliminated, scheduled at other times throughout the day, or transferred to Dulles or Baltimore-Washington. It is anticipated that both airports would pick up a small percentage of this activity.

This alternative would also permit between 36 and 44 scheduled air carrier operations per hour at National on weekdays and no change in actual air carrier operations on weekends, while maintaining the existing 60 slots per hour High Density Rule. Commuter slots at National would increase from 8 to 12 per hour on weekdays. These "extra" slots for air carriers and commuters would come at the expense of general aviation. In addition to increasing the number of permissable air carrier and commuter slots, two- and three-engine widebodied aircraft would be permitted at the airport. This combined action will serve to increase lift capacity at National to the detriment of activity at Dulles, and, to a lesser extent, at Baltimore-Washington. Dulles would be expected to lose some of its recently-captured (pre-recession) percentage of regional passengers.

Implementation of the Expanded Growth Policy at National would result in the smallest increases in future traffic at Dulles of any alternative. Additional airlines could decide to transfer service to either of the other two airports. In this case, discontinued operation of Dulles could at some further date become a reality.

Controlled Growth Policy to 18 Million Passengers at National

This policy proposal would establish a nonstop perimeter for National of 1,000 miles. Such action would, at most, result in an immediate loss of four flights per day at Dulles (from/to New Orleans and Kansas City). Future service to Birmingham and Fort Lauderdale would most likely be funnelled through National.

The policy element which would roll scheduling hours at National back to 9:30 p.m. and place a curfew on the airport from 11:01 p.m. to 6:59 a.m. could, in an insignificant manner, benefit Dulles. All activity presently using National during these hours would have to either be scheduled at other times during the day or be transferred to Dulles or Baltimore-Washington. Dulles and Baltimore-Washington would both realize increased nighttime activity, as a result of this -- much of it coming from general aviation.

This policy also calls for a ceiling of 18 Million passengers at National, to be accomplished through an immediate reduction in the hourly air carrier slots from 40 to 36 per hour in 1981 and for continued reductions at appropriate times to achieve the 18 million passenger ceiling. The slots lost by air carriers would go to commuters. Two- and three-engine new-generation narrow- and wide-bodied aircraft would be permitted at the airport.

While on one hand, this policy should improve the lift capacity at National through use of larger aircraft, the imposition of a ceiling on annual passengers would serve to control expansion of activity at that airport. Over the long term, passengers and operations would be diverted to Dulles and Baltimore-Washington, enhancing the regional roles of both airports. Dulles would be expected to attract 60 percent of the passengers diverted from National.

Controlled Growth Policy to 16 Million Passengers at National

This alternative would also establish a nonstop perimeter for National of 1,000 miles. As noted previously, the cities immediately affected at Dulles would be New Orleans and Kansas City. In the future, Birmingham and Fort Lauderdale would most likelv be served from National.

As this alternative would impose the same scheduling and operational restrictions at National as cited immediately above, the impacts at Dulles would be expected to be identical as those anticipated under the Controlled Growth to 18 Million alternative.

The effect of a passenger ceiling at National of 16 million passengers would, however, benefit Dulles sooner than the Controlled Growth Policy to 18 Million Passengers at National.

Reduced Activity Policy at National

This alternative would prohibit nonstop service between seven "grandfather" cities and National. Dulles would very likely pick up approximately 60 percent of National's current nonstop flights to these cities.

National would be closed from 10:31 p.m. to 6:59 a.m. to all traffic except emergencies. Slightly more traffic than cited above under the Controlled Growth alternatives would be realized at Dulles. Again, general aviation would be most significantly affected, as it presently has the highest percentage of nighttime activity at National.

Futhermore, a ceiling of 14 million annual passengers would be imposed at National, and air carrier slots would be reduced to 20 per hour (no extra sections would be permitted), and two- and three-engine new generation aircraft would be allowed. The hourly air carrier slot reduction would be accomplished rapidly, starting in 1981. On January 1, 1981, this policy would impose an immediate rollback from 40 to 36 air carrier slots per hour, would roll back scheduling hours from 10:00 p.m. to 9:30 p.m., and would prohibit extra sections. Each year thereafter, through 1985, four additional air carrier slots per hour would be dropped. The short term effect of this action would create a situation at National where lift capacity (the number of available seats) at the airport would fall behind passenger demand. This would be caused by the inability of the airlines to increase seating capacity in line with the reduction in slots. This lift capacity problem is expected to occur between 1983 and 1990. By 1990, however, it is expected that, through availability of two-engine wide-bodies, and through gradually-increasing boarding load factors at National, that 14 million passengers should be reached.

Dulles would benefit from this policy in terms of passenger activity. Dulles would, however, realize some serious short-term terminal and parking congestion problems because passenger levels would increase by more than 150 percent over four years. Essentially, terminal and parking capacity would not catch up to passenger demand until the late 1980s. There would be periods of significant congestion at Dulles during the mid-1980s.

Comparative Summary of Alternatives

Table III-38 depicts projected quality of service changes at Dulles under each alternative as compared to existing conditions.

TABLE III-38

COMPARISON OF IMPACTS OF POLICY ALTERNATIVES ON ONE-WAY NONSTOP QUALITY OF SERVICE AT DULLES FOR CITIES IN THE MILEAGE BANDS SHOWN

Mileage Band	1980 Existing Conditions	1990 No Policy Change	1990 Expanded Growth Policy at National	1990 Controlled Growth Policy to 18 Million Passengers at National	1990 Controlled Growth Policy to 16 Million Passengers at National	1990 Reduced Activity Policy at National
0-200	4.51	9	8	12	15	11
201-300						
New York/ Newark	9.68	21	20	24	28	23
Other Cities	0.85	2	2	6	8	8
Sub-Total	10.53	23	22	30	36	31
301-400	0.0	3	2	6	10	6
401-650	5.69	12	11	16	20	18
651-1000						
Grandfather Cities	0.0	2	2	3	4	36
Other Cities	3.0	7	3	5	6	10
Sub-Total	3.0	9	5	8	10	46
1001+	33.50	77	75	83	85	84
TOTAL	57.23	133	123	155	176	196

NATURAL SYSTEMS

Neither the present policy nor the planned policy decisions involve direct impacts on natural systems. As growth in aviation occurs, airfield and terminal modifications will likely be necessary. However, further environmental review would be required prior to any major future development at Dulles.

BALTIMORE-WASHINGTON INTERNATIONAL AIRPORT

NOISE

Introduction and Methodology

As with Dulles, Baltimore-Washington would experience a change in operations and passenger enplanements as a result of any policy decision at National. This portion of the report summarizes the existing noise conditions at Baltimore-Washington and the likely impacts that could be expected to result under the Metropolitan Washington Airports Policy alternatives.

Assumptions

For purposes of this study, the following overall conditions have been assumed at Baltimore-Washington:

* Approaches are assumed to follow tracks shown on Exhibit III-42, descending along a 3 degree glide slope;

* Aircraft departures use standard profiles as stored in the INM, based on aircraft weight corresponding to stage length. The aircraft follow the centerline of flight corridors shown on Exhibit III-42 to the several navigation aids or intersections as determined by Maryland Department of Transportation data; and

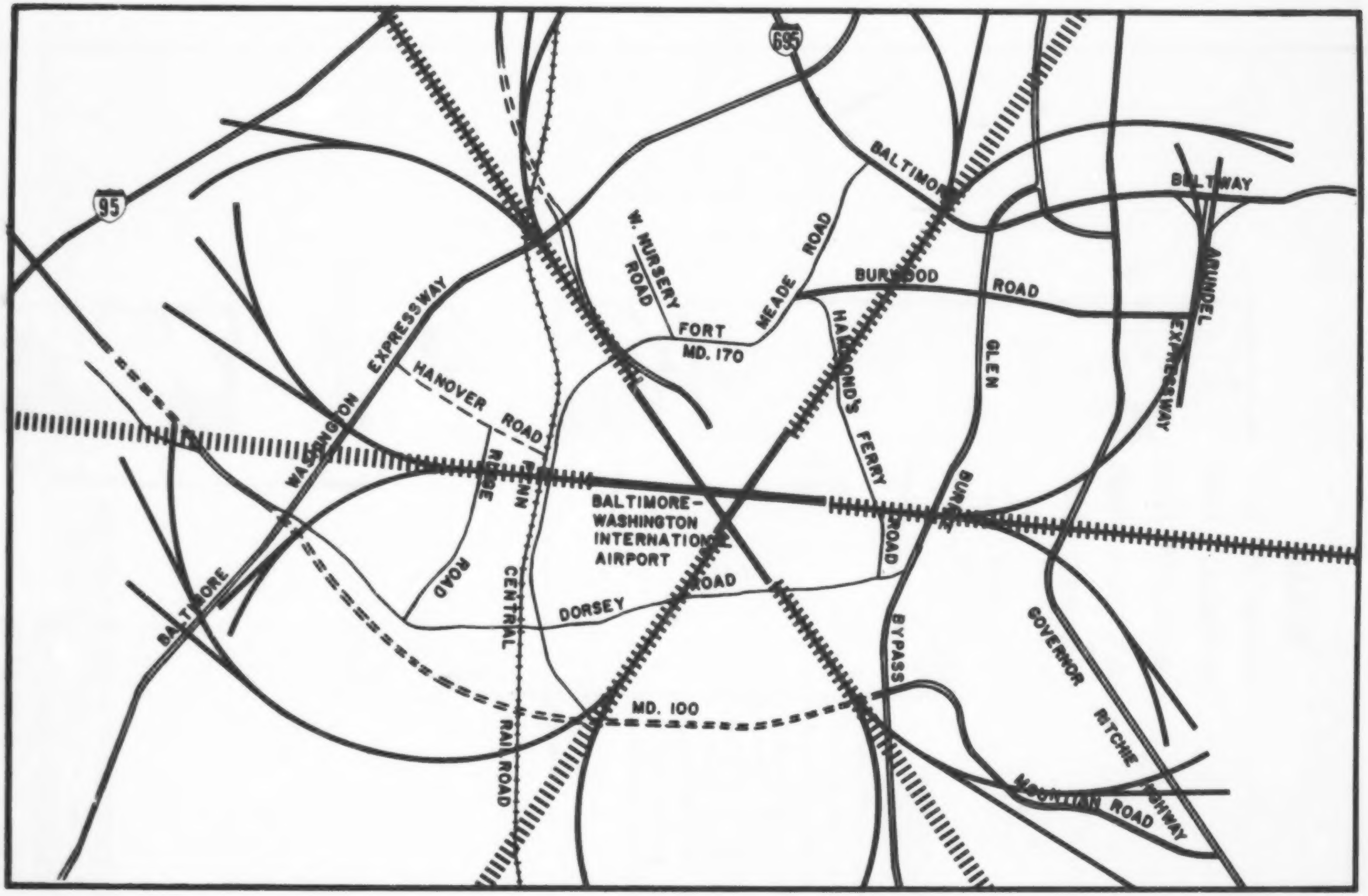
* Compliance with FAR Part 36 for aircraft has been assumed for future conditions.

Land Use and Sensitive Sites

Existing land use in the vicinity of Baltimore-Washington is provided on Exhibit III-43. Also provided on the exhibit are representative sensitive sites in the airport's noise influence area. For each of these sites, impacts will be tabulated for direct comparison between present conditions and future conditions with each of the Metropolitan Washington Airports Policy alternatives.

Existing Conditions

Table II-11 lists the 1979 base case operational data at Baltimore-Washington as well as operations anticipated to occur in 1990 under each policy option. The base case noise condition at the airport is presented on Exhibit III-43 and in Table III-39. This exhibit shows the NEF 30 contour extending about 4.5 miles northwest of the Runway 15R threshold, 4.7 miles southeast of the Runway 33L threshold, 6.7 miles east of the Runway 28 threshold, and 5.5 miles west of the Runway 10 threshold. The NEF 40 contour covers a smaller area and extends approximately 1.5, 1.7, 2.5, and 2.1 miles from the thresholds of Runways 15R, 33L, 28, and 10, respectively. The total area covered by NEF 30 contour is 18.3


95
695
BALTIMORE
BELTWAY
ARUNDEL
EXPRESSWAY
W. NURSERY ROAD
FORT MD. 170
MEADE ROAD
BURWOOD ROAD
HAMMOND'S FERRY ROAD
GLEN BURNIE BYPASS
WASHINGTON EXPRESSWAY
HANOVER ROAD
RIDGE ROAD
PENN CENTRAL RAIL ROAD
BALTIMORE-WASHINGTON INTERNATIONAL AIRPORT
DORSEY ROAD
BALTIMORE
MD. 100
GOVERNOR RITCHIE HIGHWAY
MOUNTAIN ROAD
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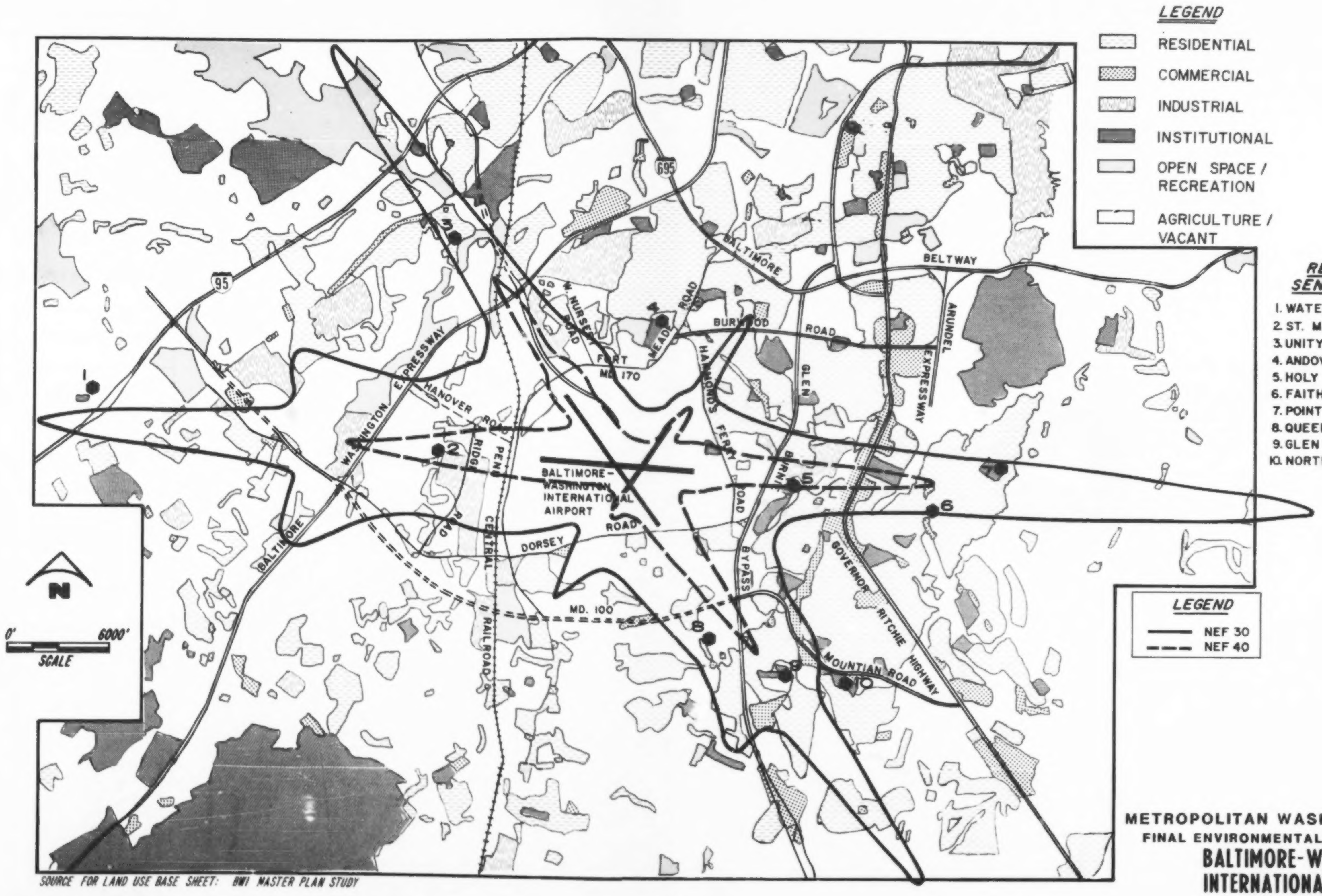
SCALE
LEGEND
TAKEOFF
LANDING

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

CENTERLINE OF FLIGHT CORRIDORS AT
BALTIMORE-WASHINGTON INTERNATIONAL AIRPORT

EXHIBIT III-42


LEGEND
RESIDENTIAL
COMMERCIAL
INDUSTRIAL
INSTITUTIONAL
OPEN SPACE / RECREATION
AGRICULTURE / VACANT
95
695
BALTIMORE
BELTWAY
BALTIMORE – WASHINGTON EXPRESSWAY
HANOVER ROAD
RIDGE ROAD
PENN CENTRAL RAILROAD
NURSERY ROAD
FORT MEADE ROAD
MD. 170
BURWOOD ROAD
HAMMONDS FERRY ROAD
GLEN BURNIE BYPASS
ARUNDEL EXPRESSWAY
GOVERNOR RITCHIE HIGHWAY
MOUNTAIN ROAD
DORSEY ROAD
MD. 100
BALTIMORE-WASHINGTON INTERNATIONAL AIRPORT
1
2
3
4
5
6
7
8
9
10
N
0'
6000'
SCALE
LEGEND
NEF 30
NEF 40

SOURCE FOR LAND USE BASE SHEET: BWI MASTER PLAN STUDY

REPRESENTATIVE SENSITIVE SITES

1. WATERLOO SCHOOL
2. ST. MARKS SCHOOL
3. UNITY CHURCH
4. ANDOVER SCHOOL
5. HOLY TRINITY SCHOOL
6. FAITH CHURCH
7. POINT PLEASANT SCHOOL
8. QUEENSTOWN SCHOOL
9. GLEN BURNIE SCHOOL
10. NORTH ARUNDEL HOSPITAL

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

BALTIMORE-WASHINGTON INTERNATIONAL AIRPORT NEF CONTOURS EXISTING CONDITIONS

EXHIBIT III-43

TABLE III-39

BALTIMORE WASHINGTON AIRPORT
NOISE LEVELS AT REPRESENTATIVE SITES
RESULTING FROM AIRCRAFT OPERATIONS

	Sensitive[a] Site No.	Existing Conditions		No Policy Change		Expanded Growth[b] Policy at National		Controlled Passenger Growth at National				Reduced Activity Policy at National	
								18 million		16 million			
		Ldn	NEF	Ldn	NEF	Ldn	NEF	Ldn	NEF	Ldn	NEF	Ldn	NEF
Sensitive Sites:													
Waterloo School	1	60	26	60	25	60	25	60	25	60	25	60	26
St. Mark's School	2	78	46	81	45	81	45	82	46	82	46	82	46
Unity Church	3	70	38	69	34	69	34	69	34	70	35	70	35
Andover School	4	57	22	59	24	59	24	59	24	59	24	60	24
Hold Trinity School	5	71	38	72	36	72	36	73	37	73	37	73	37
Faith Church	6	63	29	61	26	61	26	62	27	62	27	62	27
Point Pleasant School	7	66	33	61	26	61	26	61	26	62	27	62	27
Queenstown School	8	69	35	71	35	71	35	71	35	71	35	71	35
Glen Burnie School	9	70	38	70	36	70	35	70	36	71	36	71	36
North Arundel Hospital	10	62	28	62	27	62	27	63	27	63	28	63	28

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[a] See Exhibit III-43 for site location.

[b] Estimated.

square miles, while the NEF 40 contour covers about 3.4 square miles. It is estimated that about 30,000 persons presently live within the NEF 30 contour.

The major reason for the long extension of existing contours is the predominance of nighttime flights of the large, loud, four-engine B-707-type aircraft. Due to the weighting of nighttime operations by the noise model, the 9.4 nighttime operations of the B-707-type aircraft are actually equivalent, in terms of noise exposure, to approximately 156 daytime operations. Also, the existing B-707-type aircraft is one of the loudest commercial aircraft in operation today. Therefore, the existence of these types of operations during the nighttime hours significantly affects the noise contours at Baltimore-Washington.

Table III-39 lists noise exposure data at representative sites around the airport influence area. The sites listed show that the NEF values range from 22 to 46. Table A-13, provided in the Appendix, shows that the representative sites receive, during a 24-hour period, between 0 and 14 minutes of aircraft noise above 85 dBA.

In an effort to minimize the impact of noise around airports, the State of Maryland has enacted the Maryland Environmental Noise Act of 1974. This requires the State Aviation Administration to adopt noise abatement plans to lessen the effects of aircraft noise on people living near a public airport. In addition, the Administration is required to adopt noise zones to prevent incompatible development around these airports.

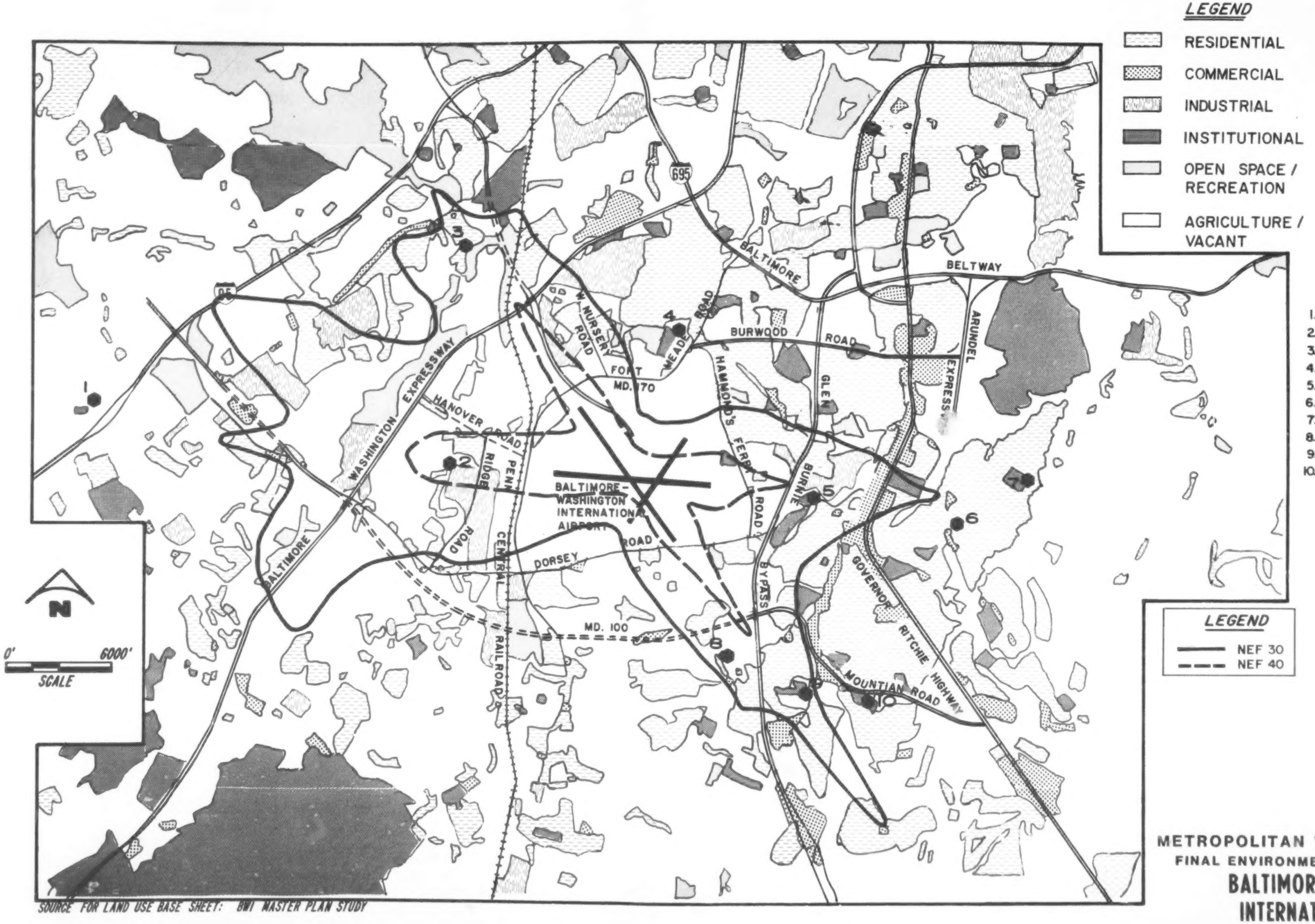
Impacts of Policy Alternatives

Changes in operational activity at National and Dulles are expected to result in changes in operations and passengers at Baltimore-Washington.

Table II-11 listed the operations anticipated to occur at Baltimore-Washington under each of the policy alternatives. Table III-39 and Exhibits III-44 through III-47 indicate the level of noise exposure anticipated to result from the various policy options. In addition, Appendix Tables A-14 through A-17 provide time above (TA) data at representative sensitive sites near Baltimore-Washington for each of the policy alternatives.

Comparative Summary of Noise Impacts

A comparative summary of noise data by alternatives is provided in Table III-39 and on Exhibit III-48. As was the case at Dulles, noise exposure is not significantly different between alternatives. Areas of exposure within the NEF 30 range from 19.3 square miles to 23.0 square miles, with corresponding populations within the NEF 30 contour of 22,900 and 25,700 persons. Relatively small differences in noise exposure are also indicated in Appendix Tables A-14 through A-17, which indicate time above (TA) values at representatives sites.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ARUNDEL EXPRESSWAY
WEADE ROAD
NURSERY ROAD
FORT MD. 170
HAMMOND'S FERRY ROAD
GLEN BURNIE BYPASS
HANOVER ROAD
WASHINGTON EXPRESSWAY
BALTIMORE
RIDGE ROAD
PENN CENTRAL RAILROAD
BALTIMORE-WASHINGTON INTERNATIONAL AIRPORT
DORSEY ROAD
MD. 100
GOVERNOR RITCHIE HIGHWAY
MOUNTIAN ROAD
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SOURCE FOR LAND USE BASE SHEET: BWI MASTER PLAN STUDY

REPRESENTATIVE SENSITIVE SITES

1. WATERLOO SCHOOL
2. ST. MARKS SCHOOL
3. UNITY CHURCH
4. ANDOVER SCHOOL
5. HOLY TRINITY SCHOOL
6. FAITH CHURCH
7. POINT PLEASANT SCHOOL
8. QUEENSTOWN SCHOOL
9. GLEN BURNIE SCHOOL
10. NORTH ARUNDEL HOSPITAL

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

BALTIMORE-WASHINGTON INTERNATIONAL AIRPORT 1990 NEF CONTOURS NO POLICY CHANGE

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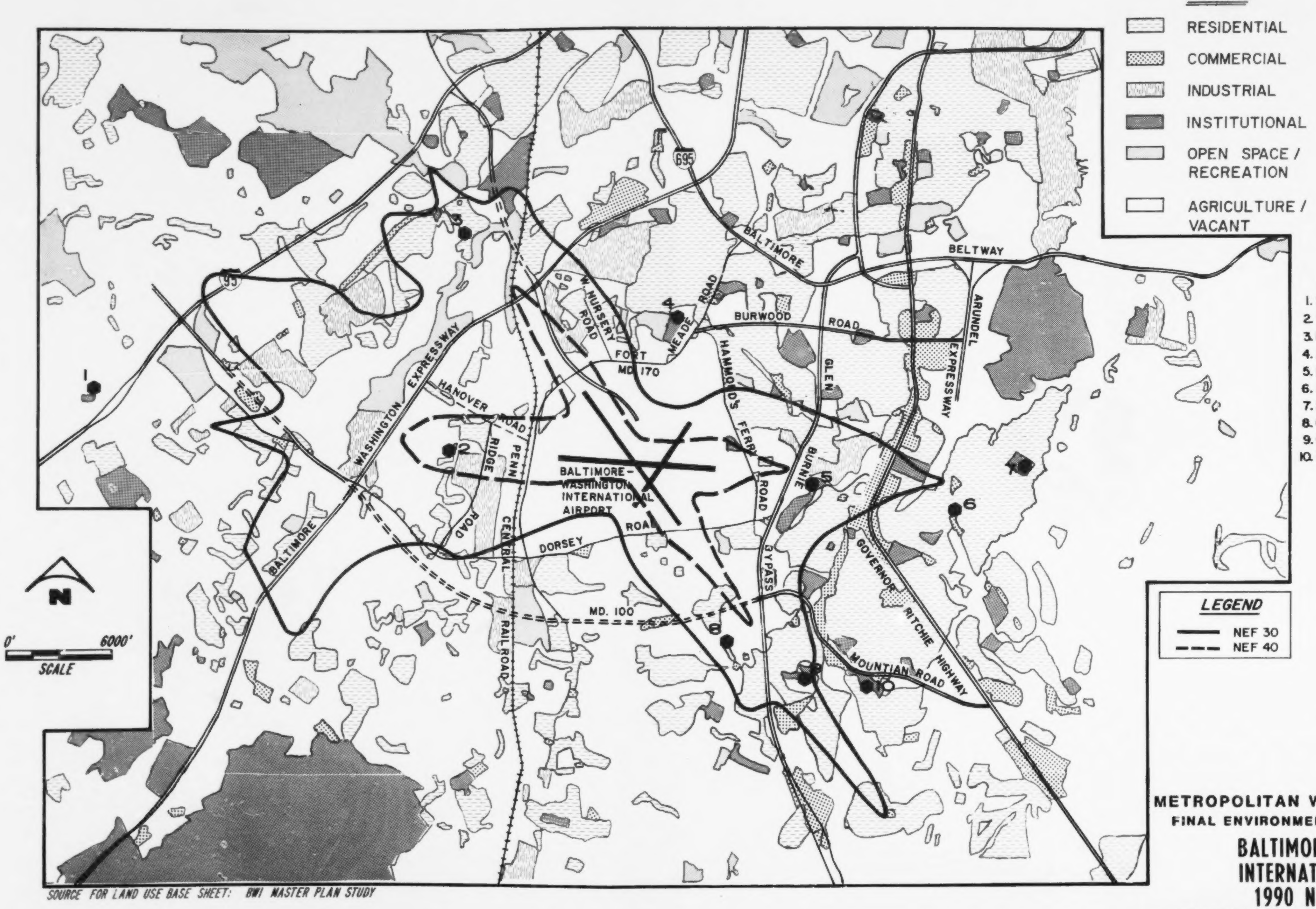
EXHIBIT III-44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BALTIMORE BELTWAY
BELTWAY
W. NURSERY ROAD
FORT MEADE ROAD
BURWOOD ROAD
MD. 170
HANOVER ROAD
RIDGE ROAD
PENN CENTRAL RAILROAD
DORSEY ROAD
MD. 100
HAMMOND'S FERRY ROAD
GLEN BURNIE BYPASS
ARUNDEL EXPRESSWAY
GOVERNOR RITCHIE HIGHWAY
MOUNTIAN ROAD
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SOURCE FOR LAND USE BASE SHEET: BWI MASTER PLAN STUDY

REPRESENTATIVE SENSITIVE SITES

1. WATERLOO SCHOOL
2. ST. MARKS SCHOOL
3. UNITY CHURCH
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6. FAITH CHURCH
7. POINT PLEASANT SCHOOL
8. QUEENSTOWN SCHOOL
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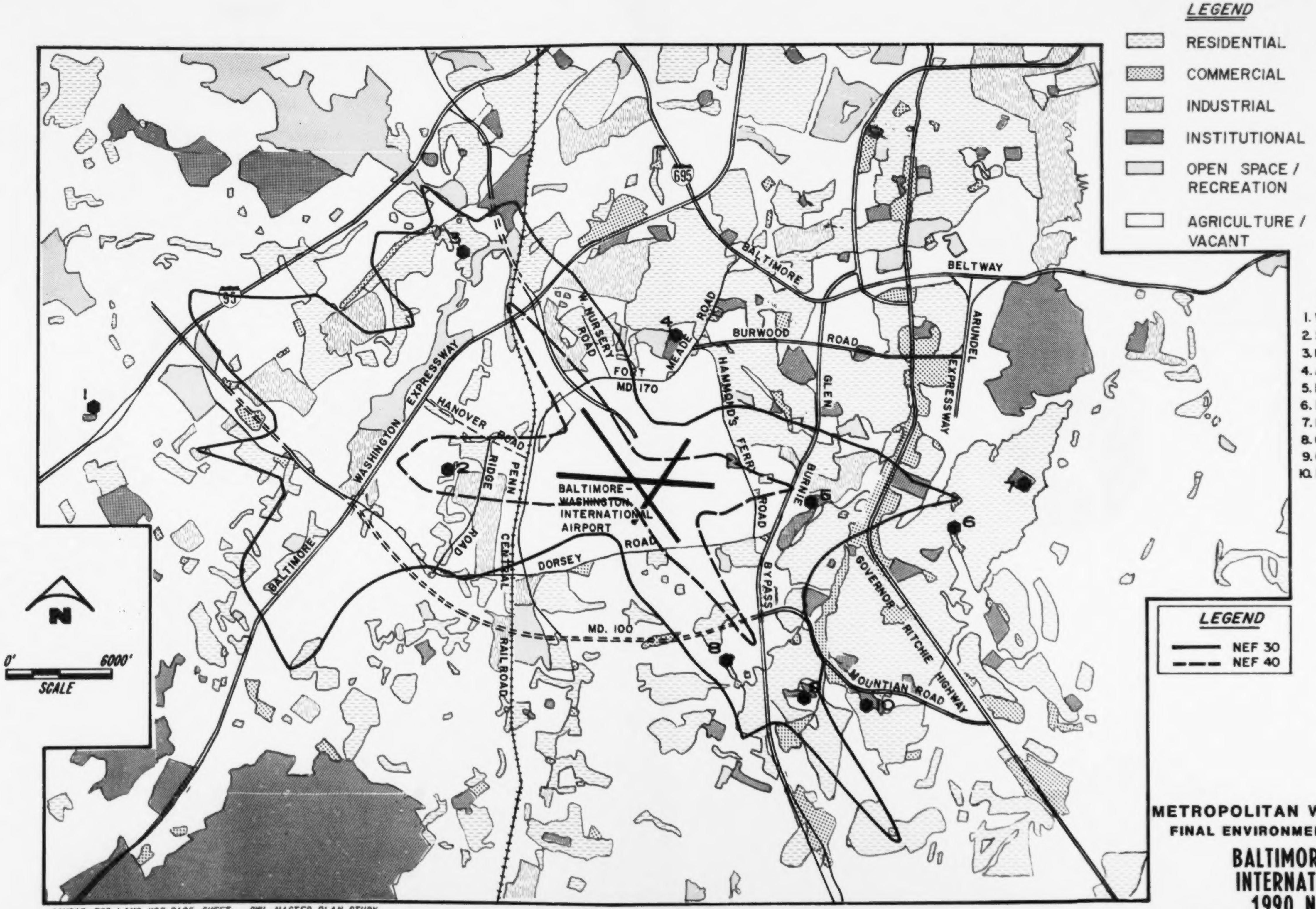
METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

BALTIMORE-WASHINGTON INTERNATIONAL AIRPORT 1990 NEF CONTOURS CONTROLLED GROWTH TO 18 MILLION PASSENGERS AT NATIONAL

EXHIBIT III-45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BALTIMORE WASHINGTON EXPRESSWAY
HANOVER ROAD
RIDGE ROAD
PENN CENTRAL RAILROAD
DORSEY ROAD
MD. 100
W. NURSERY ROAD
FORT MEADE ROAD
MD 170
BURWOOD ROAD
HAMMOND'S FERRY ROAD
GLEN BURNIE BYPASS
BALTIMORE BELTWAY
ARUNDEL EXPRESSWAY
GOVERNOR RITCHIE HIGHWAY
MOUNTIAN ROAD
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SOURCE FOR LAND USE BASE SHEET: BWI MASTER PLAN STUDY

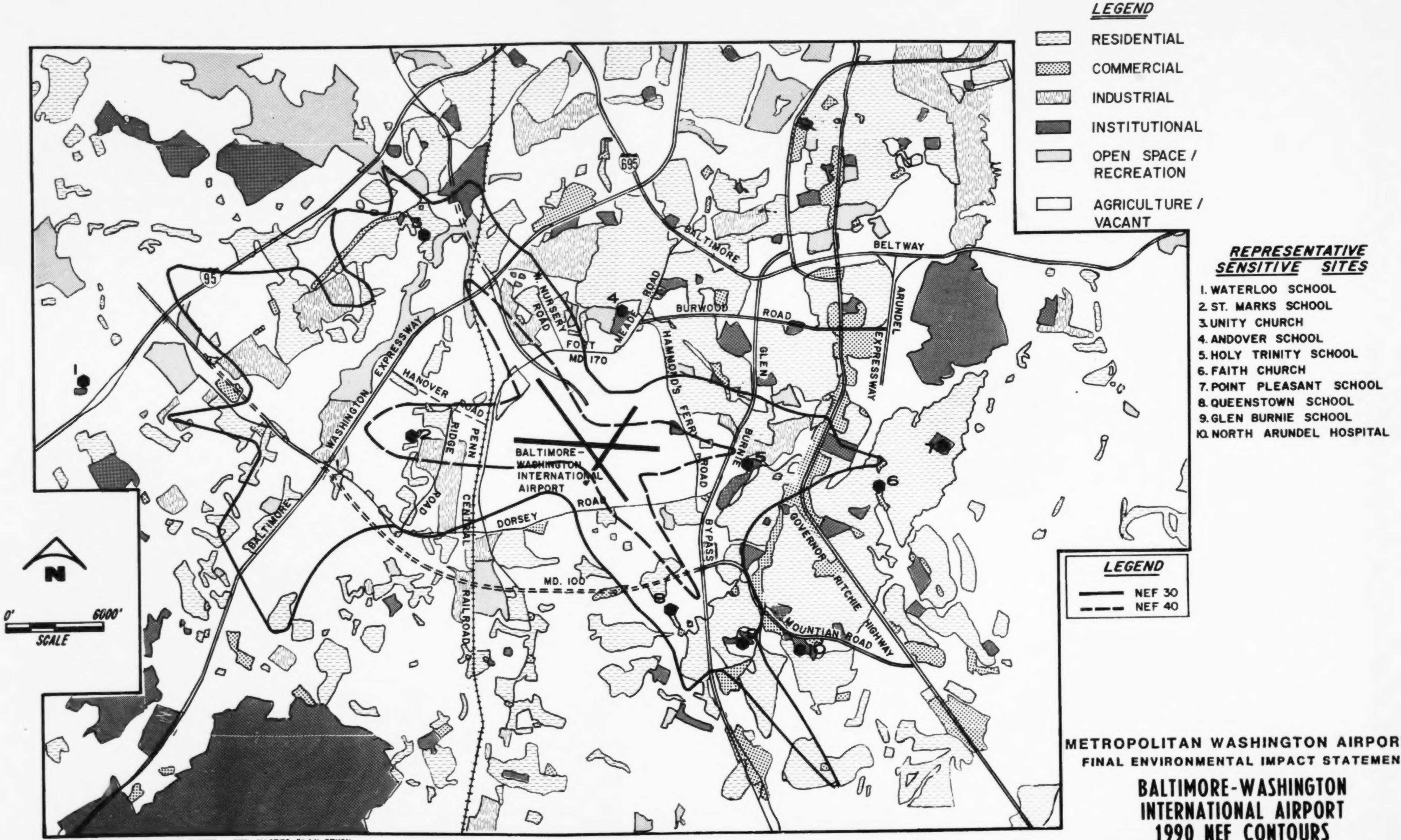
REPRESENTATIVE SENSITIVE SITES

1. WATERLOO SCHOOL
2. ST. MARKS SCHOOL
3. UNITY CHURCH
4. ANDOVER SCHOOL
5. HOLY TRINITY SCHOOL
6. FAITH CHURCH
7. POINT PLEASANT SCHOOL
8. QUEENSTOWN SCHOOL
9. GLEN BURNIE SCHOOL
10. NORTH ARUNDEL HOSPITAL

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

BALTIMORE-WASHINGTON INTERNATIONAL AIRPORT 1990 NEF CONTOURS CONTROLLED GROWTH TO 16 MILLION PASSENGERS AT NATIONAL

EXHIBIT III-46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REPRESENTATIVE SENSITIVE SITES
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3. UNITY CHURCH
4. ANDOVER SCHOOL
5. HOLY TRINITY SCHOOL
6. FAITH CHURCH
7. POINT PLEASANT SCHOOL
8. QUEENSTOWN SCHOOL
9. GLEN BURNIE SCHOOL
10. NORTH ARUNDEL HOSPITAL
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RIDGE ROAD
PENN CENTRAL RAILROAD
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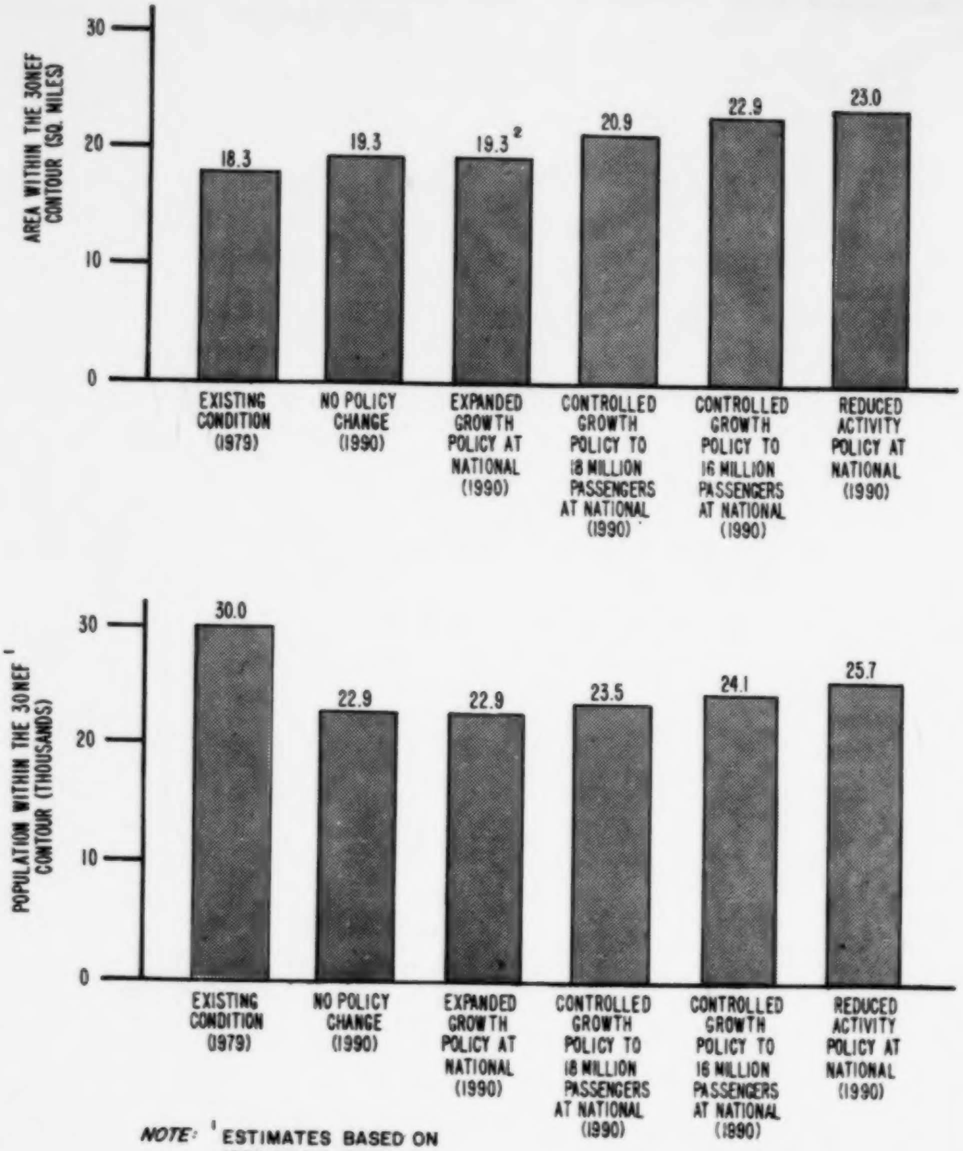
HAMMOND'S FERRY ROAD
GLEN BURNIE BYPASS
ARUNDEL EXPRESSWAY
DORSEY ROAD
MD. 100
GOVERNOR RITCHIE HIGHWAY
MOUNTIAN ROAD

SOURCE FOR LAND USE BASE SHEET: BWI MASTER PLAN STUDY

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

BALTIMORE-WASHINGTON INTERNATIONAL AIRPORT 1990 NEF CONTOURS REDUCED ACTIVITY AT NATIONAL

EXHIBIT III-47



NOTE: [1] ESTIMATES BASED ON 1980 POPULATION.
[2] ESTIMATED

METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

ALTERNATIVE NOISE IMPACT COMPARISONS AT BALTIMORE–WASHINGTON

EXHIBIT III-48

Thus, as with Dulles, as operations and enplanements are reduced at National, corresponding increases in noise exposure should result at Baltimore-Washington. However, the magnitude of the increases is not significant.

SURFACE ACCESS

Introduction and Methodology

This section summarizes, in general review format, the probable impacts of the previously detailed alternative policy plans for National upon the surface access of Baltimore-Washington.

Based on a review of data and reports received from the various Federal and State agencies, the following assumptions were made for calculating estimated 1990 Baltimore-Washington vehicle trips.[1]

* Average week originating and terminating (O and T) passengers ranges from 125,000 to 167,000;
* Peak day volume of average week O and T passengers = 16.4 percent;
* Airport-related mode split = 15 percent;
* Airport-related two-way vehicle trip rate = 2.70 trips per originating and terminating passenger; and
* Peak hour of peak weekday traffic = 8 percent.

Review of Impacts

The major access facility to Baltimore-Washington is the four-lane roadway which leads northwest from the airport terminal area, intersects with Maryland Route 170, and extends to the Baltimore-Washington Parkway. Scheduled improvements to the access system in the terminal and parking areas are nearly completed. Passengers have several surface access options at the airport, including private auto, taxi, limo (bus), rental car, and hotel courtesy cars.

The highway improvement that will most affect access to Baltimore-Washington is the extension of Maryland Route 46 from the Baltimore-Washington Parkway to I-95, which will provide a direct link from I-95 to the airport. An Amtrak rail station near Baltimore-Washington is currently under construction and is scheduled to be operating in the Fall of 1980. Shuttle buses will transport passengers between the rail station and the airport. It is expected that 2,330[1] passengers will use this rail/air link per day in 1990. In addition, there are two potential points from which Baltimore-Washington passengers can transfer from the Washington Metro to a shuttle line service to the airport. The New Carrollton Station in Prince George's County opened in November 1978; the feasibility of a New Carrollton/Baltimore-Washington shuttle connection is now being considered. Metro will be expanded to Greenbelt, Maryland, by 1990.[2] Baltimore-Washington passengers will be able to transfer at Greenbelt to an airport limousine that is operated for the Maryland State Aviation Administration.

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[1] Maryland Department of Transportation, State Aviation Administration, Baltimore-Washington International Airport Master Plan Airport Development Report.

-U.S. Department of Transportation, Federal Aviation Administration, Office of Aviation Policy, Profiles of Scheduled Air Carrier Passenger Traffic for Top 100 U.S. Airports, 1977.

The effect on surface access at Baltimore-Washington due to any policy is directly related to the corresponding enplanement projections for the facility. The five alternative policy plans currently under consideration provide for a range of total annual passengers from 7.8 million to 11.0 million in 1990. The Baltimore-Washington Master Plan projected approximately 14.6 million total passengers by 1990.

Surface traffic estimates based upon the five alternative policy passenger projections and 1979 Existing Conditions estimates were made for average week, peak weekday, and the appropriate PM peak hour at Baltimore-Washington. Table III-40 presents these estimates of surface traffic growth at Baltimore-Washington in 1990.

TABLE III-40

SUMMARY OF ESTIMATED SURFACE TRIPS AT
BALTIMORE-WASHINGTON INTERNATIONAL AIRPORT

Condition	Total Two-Way Trips Daily	Total Two-Way Trips Pm Peak Hour
1979 Existing Condition	27,500	2,200
No Policy Change	52,700	4,200
Expanded Growth Policy at National	47,000	3,800
Controlled Growth Policy to 18 Million Passengers at National	55,000	4,400
Controlled Growth Policy to 16 Million Passengers at National	59,300	4,700
Reduced Activity Policy at National	63,000	5,000

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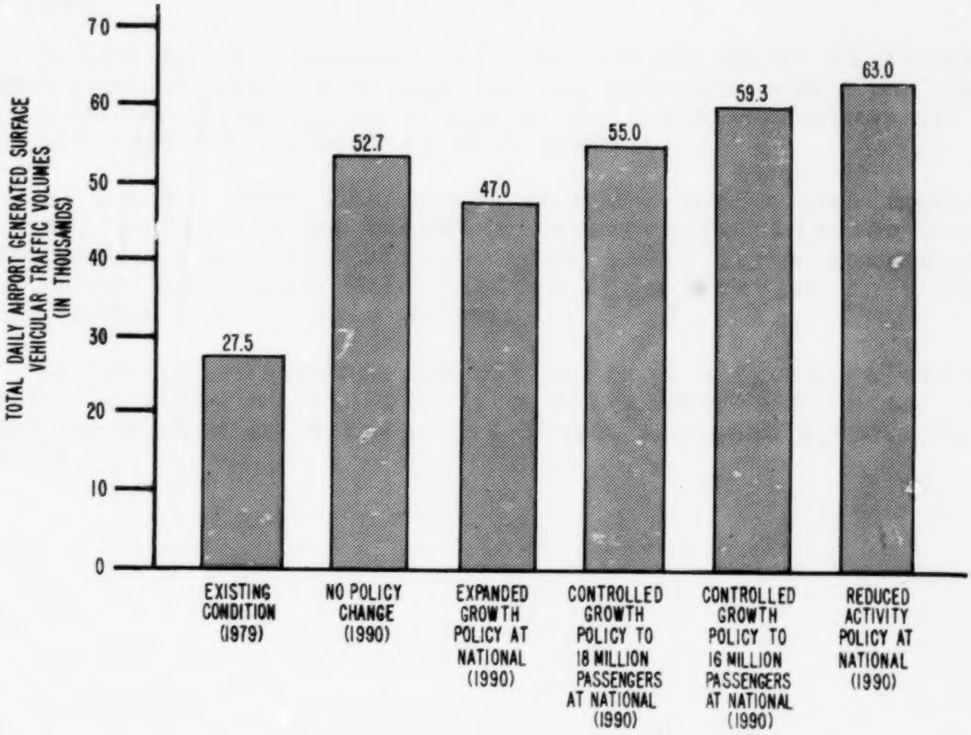
[1] Maryland State Aviation Administration.

[2] Office of Public Affairs, Washington Metropolitan Area Transportation Authority, 1980.

Thus, Table III-40 indicates that due to enplanement growth, surface traffic in 1990 is expected to increase over existing levels. Much of this growth, however, is not related to the choice of policy, but, rather, to normal growth in aviation at the airport.

Exhibit III-49 provides a graphic comparison of airport-related surface traffic generation expected to result from each of the policy options under consideration, in addition to the 1979 Existing Condition. As seen on this exhibit, the greatest increase in surface traffic should occur at Baltimore-Washington under the Reduced Activity Policy at National with over 11 million annual passengers. The least increase should occur under the Expanded Growth Policy at National with only 7.8 million passengers annually.



METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

ALTERNATIVE SURFACE TRAFFIC COMPARISONS AT BALTIMORE-WASHINGTON

EXHIBIT III-49

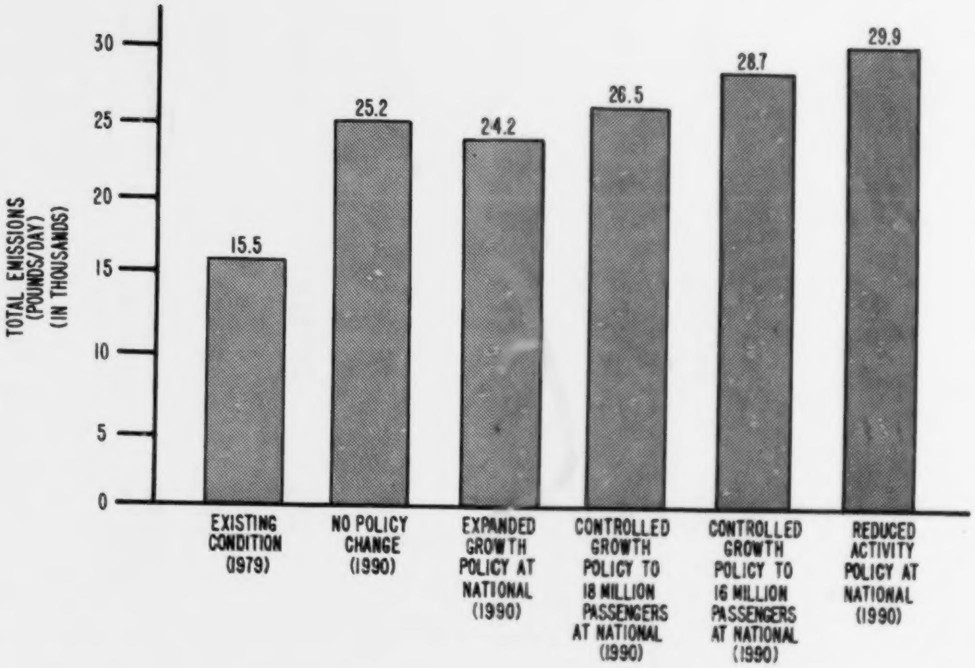
AIR QUALITY

The determination of air quality impacts at Baltimore-Washington due to the policy alternatives was based on an evaluation of total daily emissions. The source for daily loadings were aircraft operations at the airport. Totals were estimated using emission factors and operational data for the various policy alternatives. Exhibit III-50 summarizes the aircraft pollutant emissions at Baltimore-Washington Airport for each alternative analyzed.

Table III-41 presents the estimated total daily Baltimore-Washington emission loadings for the existing condition and for the Metropolitan Washington Airports Policy alternatives in 1990, for both aircraft and airport-related traffic.

As can be seen, the growth in operations at Baltimore-Washington will result in an increase in aircraft emission loadings by 1990 under all alternatives. The small variation in pollutant emissions indicates the relative insensitivity that the policy alternatives have at this airport.

Regional emissions resulting from airport-related surface traffic (including traffic from Baltimore-Washington) was previously presented by alternative in the National Airport Air Quality section.



METROPOLITAN WASHINGTON AIRPORTS

FINAL ENVIRONMENTAL IMPACT STATEMENT

TOTAL DAILY AIRCRAFT POLLUTANT EMISSIONS AT BALTIMORE-WASHINGTON

EXHIBIT III-50

TABLE III-41

EMISSION INVENTORY FOR BALTIMORE-WASHINGTON AIRPORT[a]

(pounds per day)

	PARTICULATES	SULFUR OXIDES	CARBON MONOXIDE	HYDROCARBONS	NITROGEN OXIDES	TOTAL
Existing (1979)	679	516	48,260	7,623	6,556	63,634
No Policy Change at National	1,245	873	41,898	6,690	9,732	60,439
Expanded Growth Policy at National	1,138	818	38,715	6,294	9,014	55,979
Controlled Growth Policy to 18 Million at National	1,315	925	44,067	7,019	10,369	63,695
Controlled Growth Policy to 16 Million at National	1,420	1,010	47,413	7,719	11,236	68,798
Reduced Activity Policy at National	1,504	1,063	49,971	8,134	11,868	72,538

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[a] Includes emissions from aircraft and airport-related traffic.

SOCIAL AND ECONOMIC CONDITIONS

Introduction and Methodology

The parameters involved in evaluating the primary and secondary socioeconomic effects of the various policy alternatives were discussed previously in the National Airport Social and Economic Conditions section of this report. In addition, a detailed discussion of the social and economic impacts of the alternatives is contained in a companion document to this FEIS entitled, "Economic Report/Urban and Community Impact Analysis." The reader is referred to this other document for further information.

Existing Conditions

Approximately 3,100[1] full-time employees now work at Baltimore-Washington. With salaries averaging $16,700, the total payroll at the airport exceeds $51.8 million.

The 1978 Master Plan Economic Report indicates that over 97 percent of Baltimore-Washington employees reside in Maryland; 45 percent of all airport employees live in Anne Arundel County. Thus, the majority of employee spending would be expected to occur in Maryland and especially in Anne Arundel County.

Economic impacts of airport operation include concession revenues and payments and the collection of landing fees. The total concession revenue figure for 1979 is not available.[2] However, over $4.9 million was paid in concessionaire and tenant payments to the State Aviation Administration (SAA) in 1979. Landing fees at present exceed $1.8 million. Thus, the combined impacts of employee payroll and landing fees at Baltimore-Washington are nearly $53.6 million. Including the recycling effect of these components on economic impacts, but excluding secondary impacts, the overall economic impact of Baltimore-Washington exceeds $107 million.

Impacts of Policy Alternatives

Table III-42 shows the comparative economic impacts of the policy alternatives at Baltimore-Washington. In addition, Exhibit III-22 showed existing 1980 and projected 1990 employment at the airport under each alternative.

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[1] Maryland State Aviation Administration (SAA) estimate.

[2] Contributions of Baltimore-Washington to the area economy under the various policy alternatives cannot, therefore, be compared with the contributors of National and Dulles.

As evidenced by this information, all alternatives will result in increased employment, payroll, concession revenue and payment, and landing fees at Baltimore-Washington. The magnitude of these increases varies by alternative since most of the indices are based on passenger growth. As would be expected, the Reduced Activity Policy at National would yield the greatest economic benefit to Baltimore-Washington, while the Expanded Growth Policy at National would yield the smallest economic benefit.

It is expected that the employment growth at Baltimore-Washington would be distributed throughout all employment sectors, but especially in air cargo and cargo-related enterprises.

Because of the relatively high proportion of minority employees at Baltimore-Washington, the limited employment growth there will affect employment opportunities for women and minorities more than non-minorities.

In general, a 1978 FAA report found that 31.6 percent of air carrier jobs were held ny minorities and women.[1] No data on the proportions of Baltimore-Washington employees that are minorities is available. However, based on the sample airports included in the FAA study, the proportion of minorities employed by airport tenants/concessionsires should be at least 50 percent.

The airport owner, the Maryland State Aviation Administration, has an employee population of 24 percent minorities (including women).[2] Travel-related industries (hotels/motels and restaurants) have also employed high proportions (50.2 percent) of minority and women workers.[3] Thus, the increase in air travel resulting from the various policy alternatives is expected to affect both direct and indirect airport employment of minorities at Dulles.

Employee growth at Baltimore-Washington that results from the passenger limitation at National may induce a shift of employee residences to the Maryland suburbs near Baltimore-Washington. This potential shift of residences will subsequently impact the areas in which employee purchases are made; these new purchases in the vicinity of Baltimore-Washington would partially replace spending growth (for new employees) in the immediate vicinity of National.

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[1] U.S. Department of Transportation, Federal Aviation Administration, Review of Minority Participation on Airports Receiving Grant Assistance Under the Airport and Airway Development Act of 1970, July 1978, Appendix K, pp. 5-6.

[2] Ibid.

[3] U.S. Equal Employment Opportunity Commission. Equal Employment Opportunity Report 1975: Job Patterns for Minorities and Women in Private Industry, Volume I. U.S. Government Printing Office, pp. 111, 125.

TABLE III-42

COMPARATIVE ECONOMIC IMPACTS OF ALTERNATIVE POLICIES BALTIMORE-WASHINGTON INTERNATIONAL AIRPORT

	FULL-TIME EMPLOYMENT	EMPLOYEE PAYROLL[a]	CONCESSION REVENUE[a]	CONCESSION PAYMENT[a]	LANDING FEES[a]
Existing Conditions	3,100	\$ 51.8	N/A	\$ 4.9	\$ 1.8
No Policy Change	4,200	\$ 70.4	N/A	\$10.2	\$ 4.6
Expanded Growth Policy at National	3,970	\$ 66.3	N/A	\$ 9.1	\$ 4.2
Controlled Growth Policy to 18 Million Passengers at National	4,290	\$ 71.6	N/A	\$10.7	\$ 5.0
Controlled Growth Policy to 16 Million Passengers at National	4,460	\$ 74.5	N/A	\$11.5	\$ 5.4
Reduced Activity Policy at National	4,610	\$ 77.0	N/A	\$12.3	\$ 5.6

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[a] In millions of 1980 dollars.

N/A - Not Available.

AIRLINE SERVICE

Introduction Methodology

A description of the factors which effect airline service and of the general study methodology can be found in the introduction to the Airline Service Subsection under National Airport.

Existing Conditions

Baltimore-Washington International Airport has recently completed a terminal expansion and modification project to keep pace with its historically-increasing traffic. The airport presently provides service to many domestic cities, as well as to several international locations. Over the past year, while it has lost some service due to the recession, the impacts have been less than at Dulles. This was shown in Table III-18. This is in great measure due to the fact that Baltimore-Washington is located nearer to a dense population center, and since it offers a relatively superior market in connecting traffic. The airport is also only slightly behind National in commuter traffic, especially on shorter stage-lengths as was seen on Table III-21.

The nonstop perimeter agreement at National was established in an effort to enhance the role of Dulles as the region's long-haul airport. Baltimore-Washington has also been an indirect beneficiary of the perimeter agreement.

Presently, Baltimore-Washington has 22 nonstop departures to destinations beyond 650 miles from the region[1] compared to 42 for Dulles and 52 for National. All of National's 52 flights in this instance are to the seven "grandfather" cities.

Maintaining a perimeter at National (either the present agreement or eatablishing a perimeter of 1,000 miles) is expected to indirectly enhance the roll Baltimore-Washington plays in the region's air transportation system.

Baltimore-Washington has historically been unrestricted and open for continuous 24-hour service. No policy proposal would change this operating arrangement for the airport.

Approximately 13 percent of the scheduled activity at Baltimore-Washington occurs between the hours of 10:00 p.m. and 7:00 a.m.[2]

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[1] See Table III-20.

[2] U.S. Department of Transportation, Federal Aviation Administration, Profiles of Scheduled Operations by Hour by Equipment Type - Friday August 4, 1978, p. 12.

Impacts of Policy Alternatives

No Policy Change

If no change were made in the present operating policy at National, Dulles would continue as the region's primary long-haul airport. Baltimore-Washington would continue to grow in all markets, and it is expected that long-haul service would increase accordingly.

As this alternative would maintain the existing nonstop perimeter, scheduling hours, and all other elements of the existing operating policy at National, the effects on Baltimore-Washington should be minimal.

During the course of the present economic recession, traffic may decrease somewhat over that which has occurred over the past year. Over the long-term, however, it is anticipated that the long-haul routes at Baltimore-Washington will continue to be strong.

The airport should continue to grow in percentage of regional passengers, especially as a natural ceiling is reached at National when the allowable slots become saturated.

Expanded Growth

This alternative would establish a nonstop perimeter for National of 1,000 miles. The cities within this milage band which could potentially lose nonstop service from Baltimore-Washington are New Orleans, Fort Lauderdale, and Kansas City with a total of 12 nonstops per day. While Birmingham could be a candidate to gain nonstop service from National, it is not presently served nonstop from Baltimore-Washington.

Although no curfew would be imposed at National, the present 10:00 p.m. scheduling "hour" would be eliminated. Presently, approximately 20 flights are scheduled at National in the 10:00 p.m. minute. These 20 flights would have to be eliminated, scheduled at other times throughout the day, or transferred to Dulles or Baltimore-Washington. It is anticipated that both airports would pick up a small percentage of this activity.

This alternative would also permit between 36 and 44 scheduled air carrier operations per hour at National on weekdays and no actual change in air carrier operations on weekends, while maintaining the existing 60 slots per hour High Density Rule. Commuter slots at National would increase from 8 to 12 per hour on weekdays.

These "extra" slots for air carriers and commuters would come at the expense of general aviation. In addition to increasing the number of permissable air carrier and commuter slots, two- and three-engine widebodied aircraft would be permitted at the airport. This combined action will serve to increase lift capacity at National to the detriment of activity at Dulles, and, to a lesser extent, at Baltimore-Washington which could be expected to lose some of its recently-captured percentage of regional passengers.

Implementation of the Expanded Growth Policy at National would result in the smallest increases in future traffic at Baltimore-Washington of any alternative. There is a good likelihood, however, that several airlines could choose to transfer their operation from Dulles under this alternative. In this case, Baltimore-Washington would realize significant benefits.

Controlled Growth Policy to 18 Million Passengers at National

This policy proposal also calls for a nonstop perimeter at National of 1,000 miles. This could, at most, result in an immediate loss of some of the 12 daily flights per day at Baltimore-Washington (from/to New Orleans, Fort Lauderdale, and Kansas City). Future nonstop service to Birmingham would probably be funnelled through National.

The policy element which would roll scheduling hours at National back to 9:30 p.m. and close the airport to all traffic except for emergencies from 11:01 p.m. to 6:59 a.m. could benefit Baltimore-Washington in some ways. All activity presently using National during these hours would have to either be scheduled at other times during the day or transfer to Dulles or Baltimore-Washington. Dulles and Baltimore-Washington would both realize increased nighttime activity as a result of this -- much of it coming from general aviation.

This policy calls for a ceiling of 18 million passengers at National, to be accomplished through an immediate reduction in the hourly air carrier slots from 40 to 36 per hour in 1981 and for continued reductions at appropriate times to achieve the 18 million passenger ceiling. The slots lost by air carriers would go to commuters. Two- and three-engine new-generation aircraft would be permitted at the airport.

While on one hand, this policy should improve the lift capacity at National through use of larger aircraft, the imposition of a ceiling on annual passengers would serve to control expansion of activity at that airport. Over the long-term, passengers and operations would be diverted to Dulles and Baltimore-Washington, enhancing the regional roles of both airports. Baltimore-Washington would be expected to attract 40 percent of the passengers diverted from National.

Controlled Growth Policy to 16 Million Passengers at National

This alternative would also establish a nonstop perimeter for National of 1,000 miles. As noted previously, the cities immediately affected at Baltimore-Washington would be New Orleans, Fort Lauderdale, and Kansas City. In the future, Birmingham would likely be served from National.

As this alternative would impose the same scheduling and operational restrictions at National as cited immediately above, the impacts at Baltimore-Washington would be expected to be identical as those under the Controlled Growth to 18 Million alternative.

The effect of a passenger ceiling of 16 million passengers at National, however, would benefit Baltimore-Washington sooner than this last alternative.

Reduced Activity Policy at National

This alternative would prohibit nonstop service between the seven "grandfather" cities and National. Dulles would very likely pick up approximately 60 percent of National's current nonstop flights to these cities. Baltimore-Washington would receive the remaining 40 percent.

National would be closed from 10:31 p.m. to 6:59 a.m. to all traffic except emergencies. Slightly more traffic than cited above under the Controlled Growth alternative would be realized at Baltimore-Washington. Again, general aviation would be most significantly affected, as it presently has the highest percentage of nighttime activity at National.

Further to the benefit of Baltimore-Washington under this policy alternative, a ceiling of 14 million annual passengers would be imposed at National. Air carrier slots would be reduced to 20 per hour (no extra sections would be permitted), and the new generation of two- and three-engine aircraft would be allowed. The hourly air carrier slot reduction would be accomplished rapidly, starting in 1981. On January 1, 1981, this policy would impose an immediate rollback from 40 to 36 air carrier slots per hour, would roll back scheduling hours from 10:00 p.m. to 9:30 p.m., and would prohibit extra sections. Each year thereafter, through 1985, four additional air carrier slots per hour would be dropped. The short-term effect of this action would create a situation at National where lift capacity (the number of available seats) at the airport would fall behind passenger demand. This would be caused by the inability of the airlines to increase seating capacity in line with the reduction in slots. This lift capacity problem is expected to occur between 1983 and 1990. By 1990, however, it is expected that, through availability of two-engine widebodies, and through gradually-increasing boarding load factors at National, that 14 million passengers should be reached.

Baltimore-Washington should benefit greatly from this policy, especially in the short-term. Dulles could, however, realize some serious short-term terminal and parking congestion problems in the mid-1980s. Baltimore-Washington's recently renovated and expanded terminal should have sufficient capacity to handle its passengers.

This policy would be by far the most beneficial for Baltimore-Washington. Each element of this proposal would prove advantageous to the airport. The combined effects of these elements would prove significant.

Comparative Summary of Alternatives

Table III-43 depicts projected quality of service changes at Baltimore-Washington under each alternative as compared to existing conditions.

TABLE III-43

COMPARISON OF IMPACTS OF POLICY ALTERNATIVES ON ONE-WAY NONSTOP QUALITY OF SERVICE AT BALTIMORE-WASHINGTON FOR CITIES IN THE MILEAGE BANDS SHOWN

Mileage Bands	1980 Existing Conditions	1990 No Policy Change	1990 Expanded Growth Policy at National	1990 Controlled Growth Policy to 18 Million Passengers at National	1990 Controlled Growth Policy to 16 Million Passengers at National	1990 Reduced Activity Policy at National
0-200	20.04	39	39	43	44	42
201-300						
New York/ Newark	8.64	14	14	17	19	19
Other Cities	1.14	2	2	3	4	7
Sub-Total	9.78	16	16	20	23	26
301-400	4.34	8	8	10	12	13
401-650	25.94	48	48	50	54	50
651-1000						
Grandfather Cities	6.90	15	14	16	19	28
Other Cities	5.78	6	2	3	5	6
Sub-Total	12.68	21	16	19	24	34
1001+	9.92	27	27	29	30	31
TOTAL	82.70	159	154	171	187	196

OTHER IMPACTS

The effects of the policy alternatives on park lands, historic sites, and other sensitive uses in the vicinity of Baltimore-Washington are directly related to the off-site noise impact analysis. The noise results have been discussed earlier in this section and indicate that the policy alternatives will cause little change in noise exposure values and peak noise levels in future years. In addition, due to the relatively small difference in aircraft operations diverted to Baltimore-Washington with any of the policy options (when compared with the No Policy Change condition), only small changes in aircraft energy usage would be expected to occur at Baltimore-Washington.

It is felt that the analysis contained within this FEIS accurately reflects the influence that the policy alternatives for National and Dulles would have on the operation of Baltimore-Washington. However, this FEIS should not provide the basis for detailed off-airport land planning, use of noise contours in compliance with the Maryland Environmental Noise Act, or use of other environmental data in support of Baltimore-Washington's site-specific impacts. The basis for such information is contained in the 1978 Baltimore-Washington International Airport Master Plan.

SECTION IV: UNAVOIDABLE ADVERSE EFFECTS AND ACTIONS TAKEN TO MINIMIZE HARM

All of the policy options under consideration within this FEIS will continue to have some unavoidable adverse consequences. For example, there will still be some exposure to aircraft noise, some emissions of air pollutants, some use of energy supplies and some effects from similar environmental parameters resulting from any of the alternatives.

Throughout the evaluation of environmental consequences (Section III of this report), measures to minimize these unavoidable adverse effects have been presented for each of the policy alternatives.

It is clear from a review of Section III that there is no alternative which, if selected, would minimize the adverse consequences of all environmental disciplines. In addition, positive environmental consequences which would result at one of the three major airports would typically have negative consequences at the others. In addition, decisions which result in measures which would have very positive consequences to the local environment around National generally are negative in terms of the expressed national interests concerning the quality of air servic es into National. Conversely, decisions made which expands air services at National are generally at the expense of the local environment.

Thus, the process of selecting a policy for the Metropolitan Washington Airports is in itself an evaluation of mitigating measures. In making the decision, consideration must be given to the degree to which adverse consequences can be mitigated in one environmental discipline without unduely increasing the adverse effects in others.

SECTION V: RELATIONSHIP BETWEEN SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

None of the policy options are absolutely irreversible, nor would it necessarily permanently foreclose future operational options. It would represent, however, a basis for subsequent planning at all three regional airports and would be implemented with the knowledge of the effects of various alternative policies.

Three of the policy alternatives for the Washington Airports would allow for the managed growth in air passengers at National while at the same time increasing the utilization of Dulles. This would reinforce the heretofore informal differentiation of the airports' roles. Use of National would increase without control under the No Policy Change and Expanded Growth alternatives.

The maintenance and enhancement of the productivity associated with close in-town air transportation and its supporting services is not accomplished without affecting segments of the local and regional environment. An immediate short-term noise reduction at National would be realized through the rollback of schedule hours to 9:30 p.m. and curfew for the airport at night under the Controlled Growth and Reduced Activity alternatives. Cumulative daily noise exposure would also be reduced in the long-term with the Controlled Growth and Reduced Activity alternatives due to reductions in total numbers of air carrier aircraft and as a result of the introduction of the relatively quiet new-generation aircraft. These policies would result in slightly higher noise levels in the vicinity of Dulles and Baltimore-Washington airports over that which would exist with No Policy Change or Expanded Growth alternatives.

Though all policies satisfy the demand for regional aviation fuel, there are both short- and long-term gains to be realized. With the introduction of wide-body aircraft at National under all but the No Policy Change alternative, the airlines could schedule a more energy-efficient fleet mix to handle the daily and seasonal fluctuations in passenger demands. However, in the future, with a greater number of enplanements diverted from National, energy usage associated with surface access from the three regional airports would increase. This would be most seriously felt under the Controlled Growth and Reduced Activity alternatives. Not until the mid- to late 1990s, would a natural ceiling at National be reached under the No Policy Change and Expanded Growth alternatives.

SECTION VI: IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Each day's operation of the Washington Airports - National and Dulles - represents an irretrievable commitment toward meeting the air transportation needs of the National Captial region. Since the Federal government owns and operates the two airports, this commitment means that Federal funds are expended daily for their operation. These expenditures are offset by revenues collected from airport users.

In addition to these expenditures, other resources are affected: certain lands are exposed to aircraft noise; the air receives emissions from airport-related sources; aviation fuel is consumed; and regional economic resources are stimulated.

The alternative policies for the future operation of the two airports, when viewed strictly as alternative administrative actions, are not irreversible actions. The actions involve the operational roles of the airports in contrast to immediate construction actions. However, since any policy would be implemented by Federal Regulation, it would represent the strong commitment to clearly define the role and operation of Washington's two Federal airports.

In this regard, any decision to implement any policy would be viewed as a prerequisite for further planning and eventual rebuilding of National Airport. Airport developments can be undertaken only after planning has been accomplished; likewise, planning can be started only after the basic policy groundwork has been established. The adoption of a policy, therefore, would represent the formal basis and initial step in the continuation of the Federal commitment at National and Dulles airports.

Continued operation of the airports would cause adjacent lands and cultural resources to experience noise exposure from aircraft operation, though analysis has shown that the noise environment under three of the policies in 1990 would be significantly less than if no policy change was implemented or if growth of the airport was expanded. Continued operation of the airports also represents an irretrievable commitment to the use of a portion of our aviation fuel for service to and from the Capital.

The policy decision is a commitment to the continuation of the provision for the Capital's air transportation, and interfaces in a manner which clearly defines the airports' (future) roles and operations. Any subsequent master planning and/or airport development would require the initiation of environmental considerations and more specific environmental assessment. Though in the long term the sites could conceivably be converted to other uses, the services to the region provided by the operation of National and Dulles Airports over the years would be irretrievable.

SECTION VII: LIST OF PREPARERS

This report has been prepared by the U.S. Department of Transportation, Federal Aviation Administration, Metropolitan Washington Airports, with assistance from the Environmental Division of the consulting firm Greiner Engineering Sciences, Inc.

Personnel	Title & Organization	Qualifications
Federal Aviation Administration (FAA)		
Charles C. Erhard	Program Planning and Environmental Affairs Officer, FAA	Responsible for developing, recommending and assisting in the management and implementation of comprehensive airport programs for Metropolitan Washington Airports, including the processing of environmental impact statements and noise abatement activities. MS-Transportation Engineering (Airport Planning) MBA-Management Sciences BA-Business Administration Seven years experience in airport planning and the preparation and processing of environmental impact statements.
Greiner Engineering Sciences, Inc. (GES)		
Richard D. Alberts	Project Manager, GES	Project Manager in charge of all phases of environmental impact analyses for the past ten years. BS-Civil Engineering Registered Professional Engineer

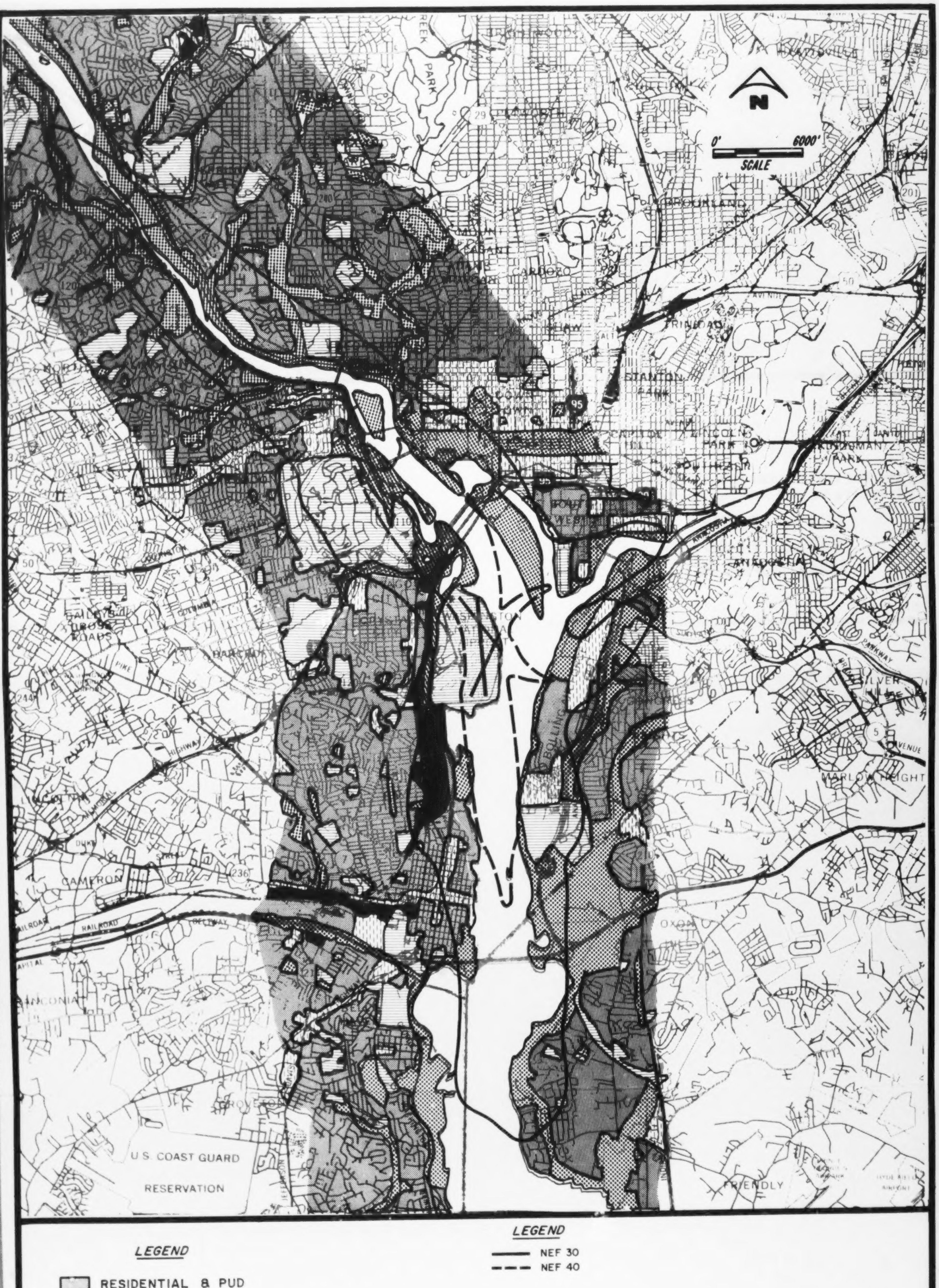
Personnel	Title & Organization	Qualifications
Thomas P. Darmody	Project Manager, GES	Project Manager and senior project planner in charge of airport forecasting, masterplanning and environmental analysis of airport projects for the past ten years. BS-Civil Engineering Master of City and Regional Planning
Susan K. Funk	Project Engineer, GES	Project Architect/Engineer in charge of terminal design, airport planning, and airport environmental assessment projects. Responsible for forecasting and report coordination. MS-Aeronautics and Astronautics Master of Architecture in Advanced Studies Bachelor of Architecture
Peter W. Zent	Noise & Energy, GES	In charge of Greiner's Acoustic Noise section. Has been in charge of acoustic noise studies for more than 50 projects. MS-Urban Planning BS-Finance
Deborah L. Calevich	Social and Economic Impacts, GES	Project Planner in charge of several major land development environmental assessment projects. BA-Political Science Master of City and Regional Planning

Personnel	Title & Organization	Qualifications
Ronald W. Gregory	Surface Traffic, GES	Senior Project Planner in charge of Greiner's Transportation, Land, and Urban Planning section. Has been in charge of planning and environmental analysis for more than 60 projects. MA-Urban and Regional Geography BA-Urban Geography
H.R. Hammond	Air Quality, GES	Senior Project Engineer in charge of Greiner's Air Quality and Meteorological section. Has been in charge of air quality studies for more than 100 projects. MS-Transportation Engineering BS-Engineering Science
Constance A. Julian	Air Quality, GES	Chemist in charge of air quality analysis and testing for Greiner. Has participated in the preparation of numerous large scale projects. BS-Clinical Chemistry

APPENDIX A

NOISE

NOISE EXHIBITS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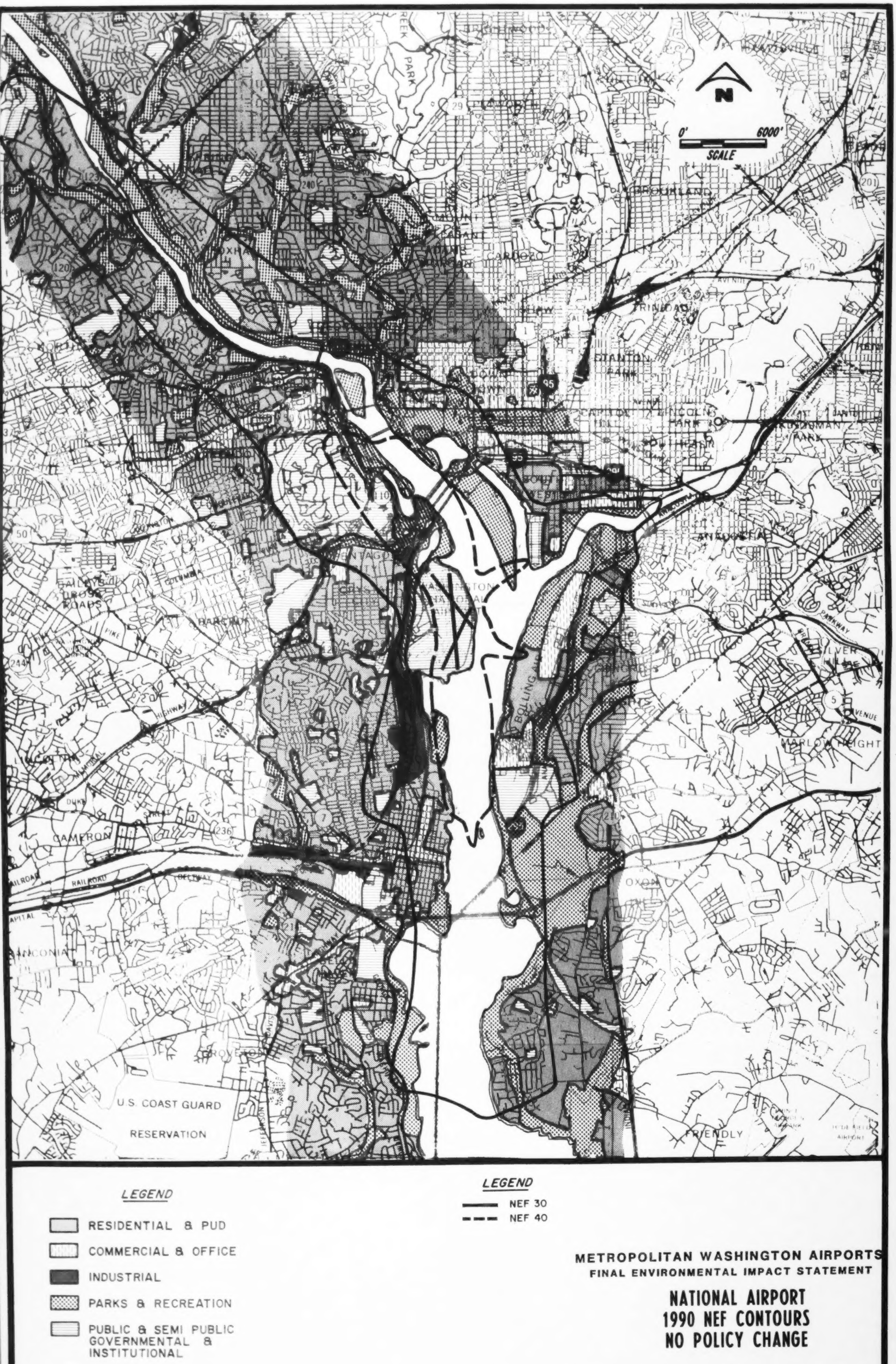
METROPOLITAN WASHINGTON AIRPORTS

FINAL ENVIRONMENTAL IMPACT STATEMENT

NATIONAL AIRPORT
NEF CONTOURS
EXISTING CONDITIONS

EXHIBIT A-1



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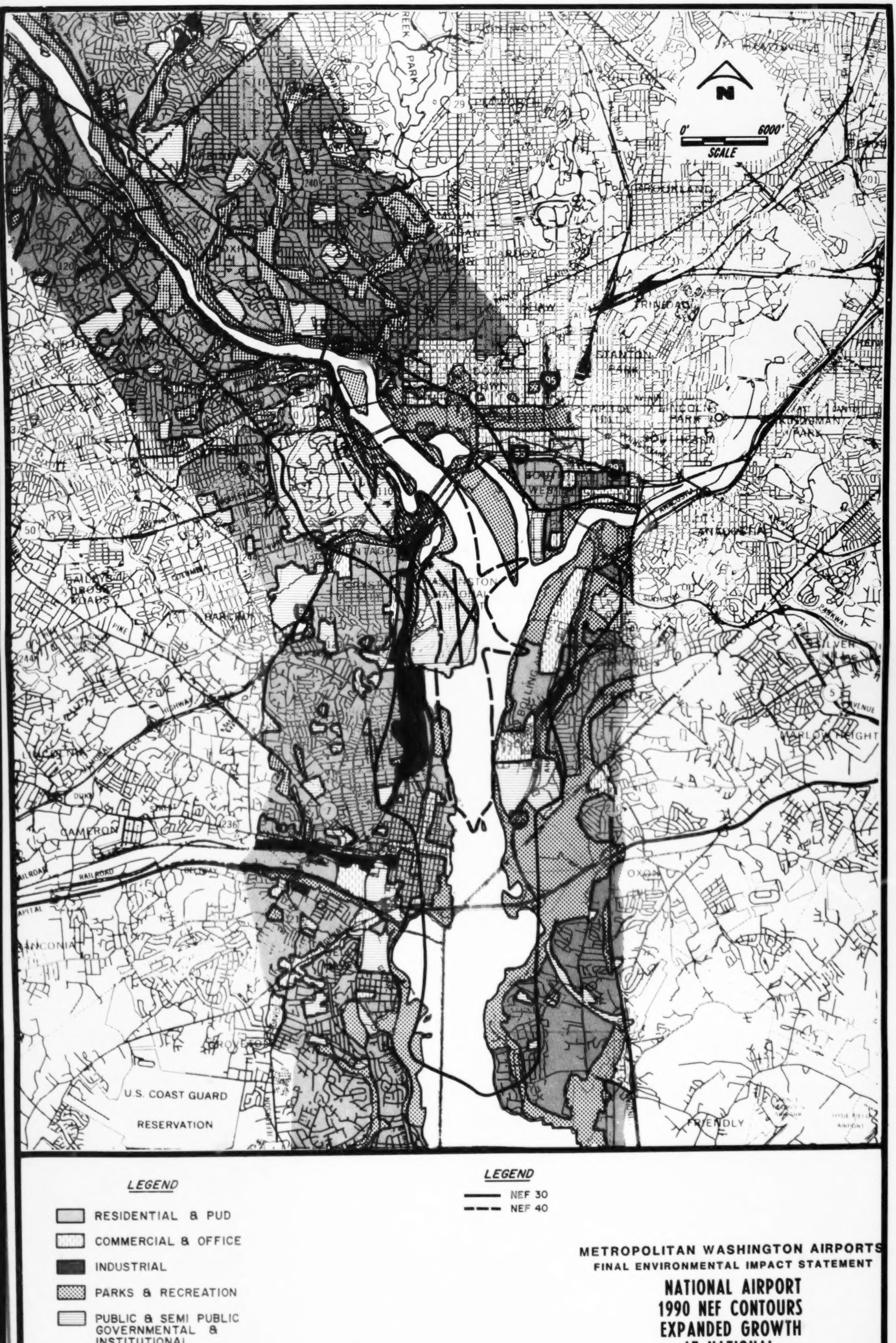
METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

NATIONAL AIRPORT
1990 NEF CONTOURS
NO POLICY CHANGE

EXHIBIT A-2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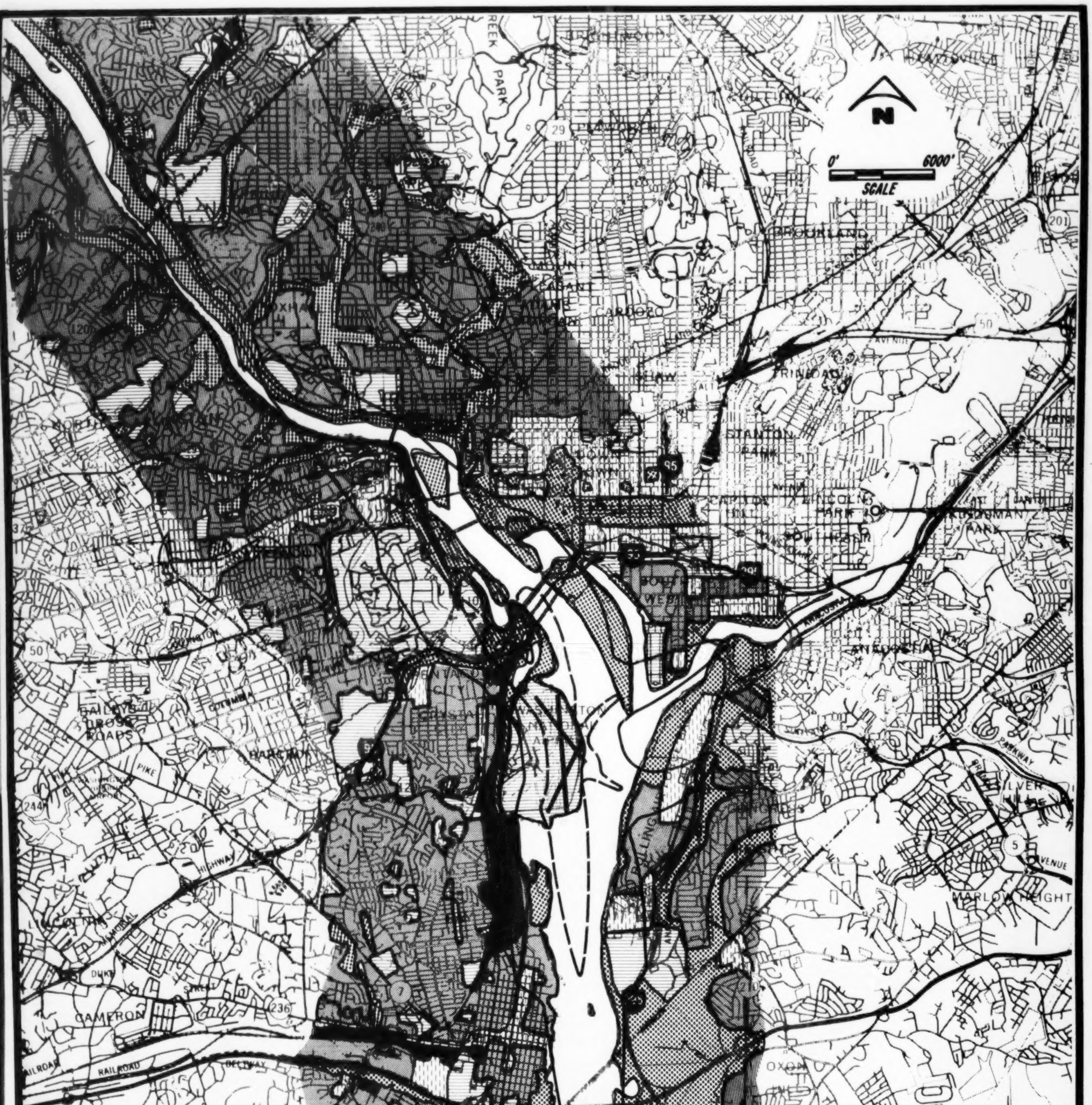
METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

NATIONAL AIRPORT
1990 NEF CONTOURS
EXPANDED GROWTH
AT NATIONAL

EXHIBIT A-3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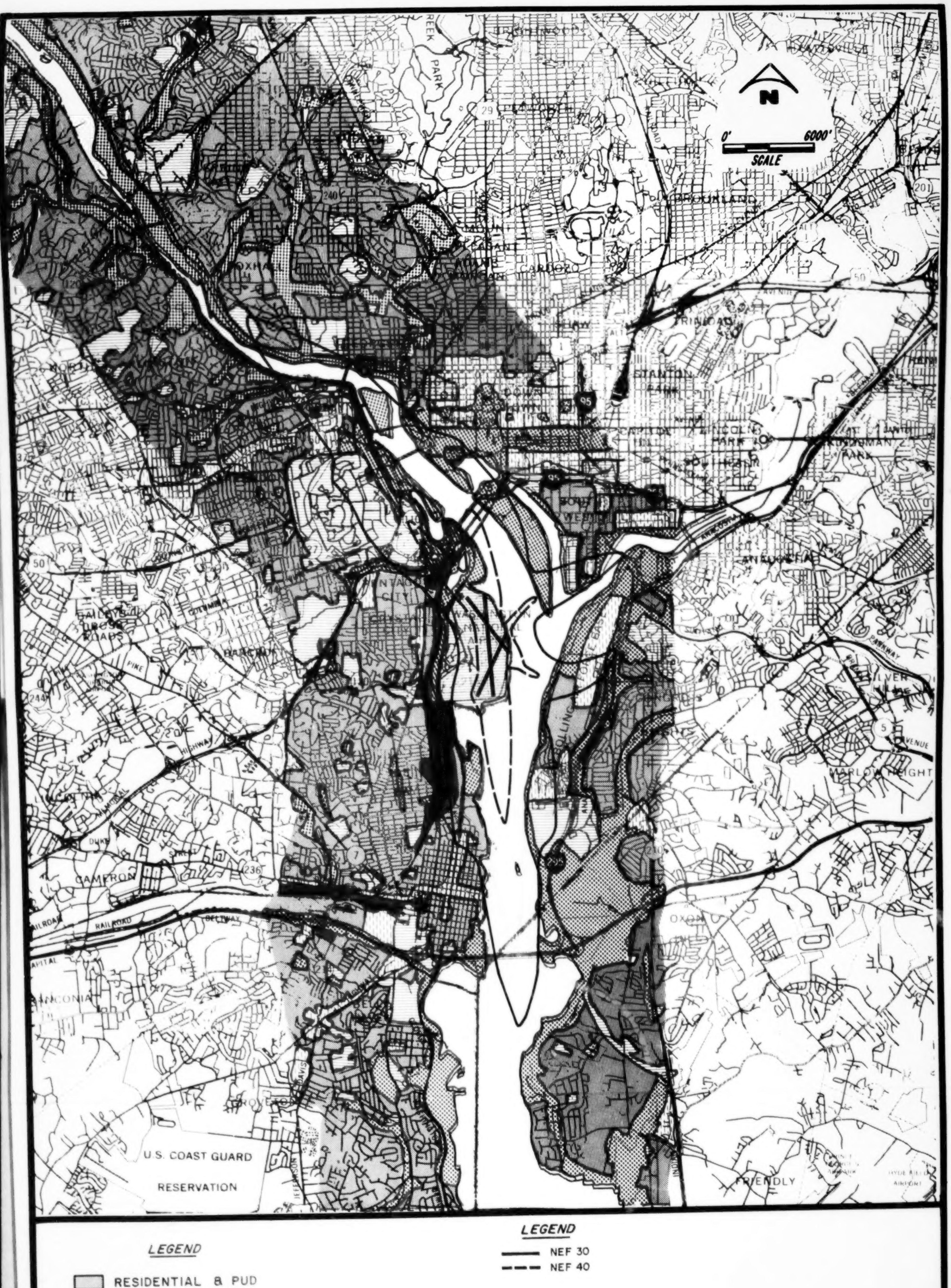
METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

NATIONAL AIRPORT
1990 NEF CONTOURS
CONTROLLED GROWTH TO 18 MILLION PASSENGERS AT NATIONAL

EXHIBIT A-4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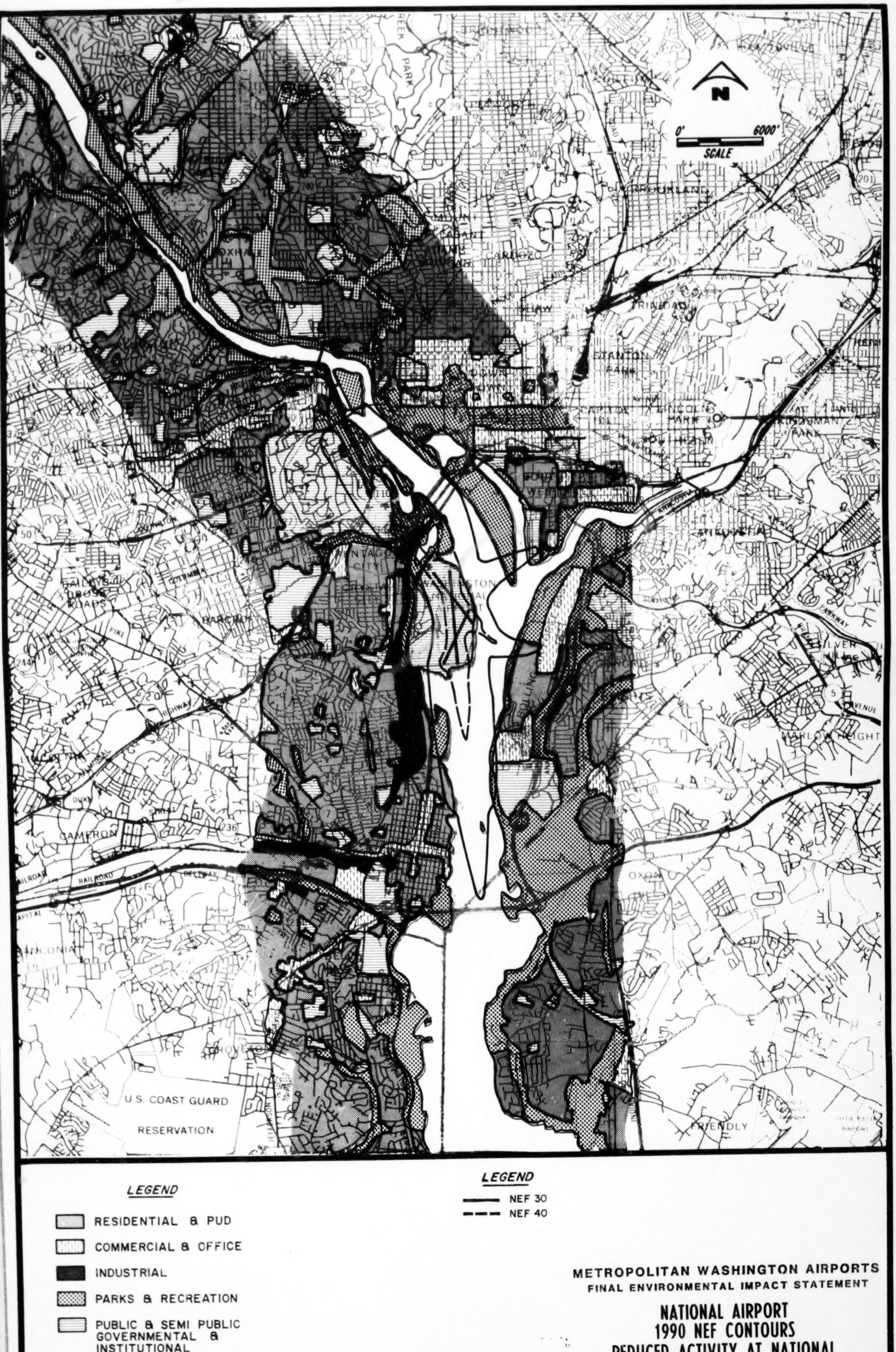
METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

NATIONAL AIRPORT
1990 NEF CONTOURS
CONTROLLED GROWTH TO 16 MILLION PASSENGERS AT NATIONAL

EXHIBIT A-5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METROPOLITAN WASHINGTON AIRPORTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

NATIONAL AIRPORT
1990 NEF CONTOURS
REDUCED ACTIVITY AT NATIONAL

EXHIBIT A-6

NOISE TABLES

TABLE A-1

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

EXISTING CONDITIONS (1979)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
1	Gadsby's Tavern	24 Hour Day	487.4	156.2	30.5	4.8	0.0	76	39
		Evening	76.4	24.5	4.7	0.7	0.0		
		Night	24.7	6.4	1.0	0.2	0.0		
2	Lloyd House	24 Hour Day	333.5	82.8	1.2	0.0	0.0	69	33
		Evening	52.3	13.0	0.2	0.0	0.0		
		Night	10.2	2.5	0.0	0.0	0.0		
3	Tidal Basin	24 Hour Day	265.5	79.5	0.1	0.0	0.0	69	33
		Evening	41.8	12.5	0.0	0.0	0.0		
		Night	8.0	2.5	0.0	0.0	0.0		
4	The Lyceum	24 Hour Day	333.5	82.8	1.2	0.0	0.0	69	33
		Evening	52.3	13.0	0.2	0.0	0.0		
		Night	10.2	2.5	0.0	0.0	0.0		
5	Jones Point Lighthouse	24 Hour Day	414.5	138.6	22.3	0.0	0.0	73	37
		Evening	64.9	21.8	3.5	0.0	0.0		
		Night	14.7	4.1	0.7	0.0	0.0		
6	Arlington Memorial Bridge	24 Hour Day	394.9	177.9	35.6	7.7	0.7	77	41
		Evening	62.4	28.2	5.6	1.2	0.1		
		Night	18.4	8.3	1.1	0.2	0.0		
7	Theodore Roosevelt	24 Hour Day	401.6	151.3	31.4	2.7	0.0	75	38
		Evening	63.5	23.9	4.9	0.4	0.0		
		24 Hour Day	18.2	5.2	1.0	0.1	0.0		

TABLE A-1 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES
RESULTING FROM AIRCRAFT OPERATIONS

EXISTING CONDITIONS (1979)

Site No.	Description	Period	Time (Minutes) Above Indicated dBA Level 65	75	85	90	95	Ldn	NEF
8	Georgetown Historic District	24 Hour Day	296.4	71.8	0.0	0.0	0.0	66	30
		Evening	46.7	11.2	0.0	0.0	0.0		
		Night	8.8	2.4	0.0	0.0	0.0		
9	Glover Archibold Parkway	24 Hour Day	325.8	113.3	4.3	0.0	0.0	70	33
		Evening	51.5	17.8	0.7	0.0	0.0		
		Night	10.9	3.5	0.1	0.0	0.0		
10	Arlington National Cemetery	24 Hour Day	249.4	65.1	1.6	0.0	0.0	68	31
		Evening	39.3	10.1	0.3	0.0	0.0		
		Night	7.4	2.0	0.1	0.0	0.0		
11	Arlington House - Robert E. Lee Memorial	24 Hour Day	244.0	88.9	7.8	0.0	0.0	70	33
		Evening	38.3	13.9	1.2	0.0	0.0		
		Night	7.5	2.7	0.3	0.0	0.0		
12	Ft. Myer Historic District	24 Hour Day	229.9	52.8	0.0	0.0	0.0	66	29
		Evening	36.1	8.2	0.0	0.0	0.0		
		Night	6.8	1.7	0.0	0.0	0.0		
13	Doubleday Mansion	24 Hour Day	302.3	90.6	14.8	0.0	0.0	71	34
		Evening	47.6	14.2	2.3	0.0	0.0		
		Night	9.9	2.7	0.5	0.0	0.0		
14	The Glebe	24 Hour Day	204.0	13.3	0.0	0.0	0.0	60	25
		Evening	32.1	2.1	0.0	0.0	0.0		
		Night	6.0	0.4	0.0	0.0	0.0		

TABLE A-1 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

EXISTING CONDITIONS (1979)

Site No.	Description	Period	Time (Minutes) Above Indicated dBA Level 65	75	85	90	95	Ldn	NEF
15	C. R. Drew House	24 Hour Day	210.0	5.4	0.0	0.0	0.0	61	25
		Evening	32.8	0.8	0.0	0.0	0.0		
		Night	6.6	0.2	0.0	0.0	0.0		
16	Alexandria Historic District	24 Hour Day	321.4	84.2	3.0	0.0	0.0	70	33
		Evening	50.4	13.2	0.4	0.0	0.0		
		Night	9.8	2.5	0.1	0.0	0.0		
17	Bank of Alexandria	24 Hour Day	487.4	156.2	30.5	4.8	0.0	76	39
		Evening	76.4	24.5	4.7	0.7	0.0		
		Night	24.7	6.4	1.0	0.2	0.0		
18	Carlyle House	24 Hour Day	487.4	156.2	30.5	4.8	0.0	76	39
		Evening	76.4	24.5	4.7	0.7	0.0		
		Night	24.7	6.4	1.0	0.2	0.0		
19	Christ Church	24 Hour Day	333.5	82.8	1.2	0.0	0.0	69	33
		Evening	52.3	13.0	0.2	0.0	0.0		
		Night	10.2	2.5	0.0	0.0	0.0		
20	Potomac Gorge and C&O Canal	24 Hour Day	303.5	96.2	16.1	0.0	0.0	71	35
		Evening	47.9	15.1	2.5	0.0	0.0		
		Night	9.8	3.0	0.5	0.0	0.0		
21	St. Mary's Church	24 Hour Day	339.5	81.8	0.0	0.0	0.0	69	32
		Evening	53.2	12.8	0.0	0.0	0.0		
		Night	10.4	2.5	0.0	0.0	0.0		

TABLE A-1 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

EXISTING CONDITIONS (1979)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
22	Fort Foote Park	24 Hour Day	269.9	66.4	0.7	0.0	0.0	68	31
		Evening	42.3	10.3	0.1	0.0	0.0		
		Night	7.9	2.2	0.0	0.0	0.0		
23	Fort Foote Baptist Church	24 Hour Day	174.5	42.2	0.0	0.0	0.0	63	27
		Evening	27.2	6.5	0.0	0.0	0.0		
		Night	5.3	1.4	0.0	0.0	0.0		
24	Indian Queen School	24 Hour Day	170.5	37.8	0.0	0.0	0.0	65	29
		Evening	26.7	5.9	0.0	0.0	0.0		
		Night	5.1	1.3	0.0	0.0	0.0		
25	Brookmont School	24 Hour Day	232.6	61.3	0.0	0.0	0.0	65	29
		Evening	36.7	9.6	0.0	0.0	0.0		
		Night	6.8	2.0	0.0	0.0	0.0		
26	Sibley Hospital	24 Hour Day	246.8	71.1	0.0	0.0	0.0	67	31
		Evening	39.0	11.1	0.0	0.0	0.0		
		Night	7.2	2.3	0.0	0.0	0.0		
27	American University	24 Hour Day	193.8	17.7	0.0	0.0	0.0	61	25
		Evening	30.3	2.7	0.0	0.0	0.0		
		Night	6.0	0.6	0.0	0.0	0.0		
28	St. John's Child Dev. Center	24 Hour Day	277.9	79.0	3.2	0.0	0.0	69	32
		Evening	43.9	12.3	0.5	0.0	0.0		
		Night	8.0	2.6	0.1	0.0	0.0		

TABLE A-1 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES
RESULTING FROM AIRCRAFT OPERATIONS

EXISTING CONDITIONS (1979)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
29	Georgetown University	24 Hour Day	335.3	109.1	0.0	0.0	0.0	69	32
		Evening	53.0	17.1	0.0	0.0	0.0		
		Night	10.1	3.5	0.0	0.0	0.0		
30	Woodmont School	24 Hour Day	229.1	77.1	0.0	0.0	0.0	67	30
		Evening	36.0	12.0	0.0	0.0	0.0		
		Night	6.7	2.5	0.0	0.0	0.0		
31	Columbia Hospital	24 Hour Day	221.3	13.9	0.0	0.0	0.0	61	25
		Evening	34.8	2.2	0.0	0.0	0.0		
		Night	6.6	0.5	0.0	0.0	0.0		
32	Lincoln Memorial	24 Hour Day	346.1	116.9	12.9	0.5	0.0	73	36
		Evening	54.7	18.4	2.0	0.1	0.0		
		Night	13.3	3.8	0.4	0.0	0.0		
33	Jefferson Memorial	24 Hour Day	315.2	98.7	16.7	0.3	0.0	72	35
		Evening	50.0	15.5	2.6	0.1	0.0		
		Night	10.2	3.4	0.5	0.0	0.0		
34	St. Mary's School	24 Hour Day	346.9	79.7	0.0	0.0	0.0	69	32
		Evening	54.4	12.4	0.0	0.0	0.0		
		Night	10.4	2.5	0.0	0.0	0.0		
35	Syphax School	24 Hour Day	211.9	22.6	4.0	2.0	0.8	70	33
		Evening	33.6	3.7	0.6	0.3	0.1		
		Night	6.2	0.6	0.1	0.1	0.0		

TABLE A-1 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

EXISTING CONDITIONS (1979)

Site No.	Description	Period	Time (Minutes) Above Indicated dBA Level					Ldn
			65	75	85	90	95	
36	Hadley Hospital	24 Hour Day	222.3	48.0	0.0	0.0	0.0	64
		Evening	35.0	7.4	0.0	0.0	0.0	
		Night	6.5	1.6	0.0	0.0	0.0	
37	St. Thomas More School	24 Hour Day	154.5	1.1	0.0	0.0	0.0	58
		Evening	24.1	0.2	0.0	0.0	0.0	
		Night	4.8	0.0	0.0	0.0	0.0	
38	Gray High School	24 Hour Day	230.7	69.4	0.0	0.0	0.0	68
		Evening	36.0	10.8	0.0	0.0	0.0	
		Night	7.0	2.2	0.0	0.0	0.0	
39	St. Joseph's School	24 Hour Day	321.4	84.2	3.0	0.0	0.0	70
		Evening	50.4	13.2	0.4	0.0	0.0	
		Night	9.8	2.5	0.1	0.0	0.0	
40	Waterfowl Sanctuary	24 Hour Day	491.8	158.8	52.5	27.9	7.6	80
		Evening	77.9	25.1	8.3	4.4	1.2	
		Night	22.0	4.8	1.6	0.9	0.2	
41	Gravelly Point Park	24 Hour Day	537.0	219.7	45.6	20.0	10.3	83
		Evening	84.9	34.8	7.3	3.1	1.6	
		Night	31.1	12.5	1.9	0.6	0.3	
42	Potomac River	24 Hour Day Evening Night	N/A	N/A	N/A	N/A	N/A	72

TABLE A-1 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

EXISTING CONDITIONS (1979)

Site No.	Description	Period	Time (Minutes) Above Indicated dBA Level 65	75	85	90	95	Ldn	NEF
43	Marina	24 Hour Day Evening Night	N/A	N/A	N/A	N/A	N/A	77	42
44	Daingerfield Island	24 Hour Day	393.2	143.8	33.8	22.4	7.8	80	42
		Evening	62.0	22.6	5.2	3.5	1.2		
		Night	17.7	5.5	1.1	0.7	0.3		
45	East Potomac Park	24 Hour Day	328.8	47.2	6.4	3.3	1.4	76	38
		Evening	52.0	7.5	1.1	0.5	0.2		
		Night	9.3	1.4	0.1	0.1	0.0		
46	Jones Point Park	24 Hour Day	414.5	138.6	22.3	0.0	0.0	73	37
		Evening	64.9	21.8	3.5	0.0	0.0		
		Nignt	14.7	4.1	0.7	0.0	0.0		
47	West Potomac Park	24 Hour Day	406.1	171.7	37.5	15.2	2.2	78	42
		Evening	64.1	27.2	5.9	2.4	0.3		
		Night	20.4	8.2	1.4	0.5	0.1		
48	Potomac View Park	24 Hour Day	499.8	160.1	28.5	1.1	0.0	74	38
		Evening	78.4	25.1	4.4	0.2	0.0		
		Night	25.7	6.7	0.9	0.0	0.0		
49	The Mall	24 Hour Day	214.9	52.4	0.0	0.0	0.0	66	30
		Evening	33.8	8.2	0.0	0.0	0.0		
		Night	6.4	1.7	0.0	0.0	0.0		

TABLE A-1 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

EXISTING CONDITIONS (1979)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
50	Rock Creek and Potomac Parkway	24 Hour Day	320.1	82.4	0.9	0.0	0.0	68	32
		Evening	50.6	12.9	0.1	0.0	0.0		
		Night	9.4	2.6	0.0	0.0	0.0		
51	C&O Canal	24 Hour Day	339.4	99.2	3.9	0.0	0.0	69	32
		Evening	53.6	15.5	0.6	0.0	0.0		
		Night	10.4	3.2	0.1	0.0	0.0		
52	Archibold Parkway	24 Hour Day	373.7	134.7	24.5	0.0	0.0	73	36
		Evening	59.1	21.2	3.8	0.0	0.0		
		Night	13.7	4.0	0.8	0.0	0.0		
53	Potomac Palisades Parkway	24 Hour Day	303.5	96.2	16.1	0.0	0.0	71	35
		Evening	47.9	15.1	2.5	0.0	0.0		
		Night	9.8	3.0	0.5	0.0	0.0		
54	George Washington Memorial Parkway	24 Hour Day	384.1	140.1	28.8	0.6	0.0	74	37
		Evening	60.7	22.1	4.5	0.1	0.0		
		Night	15.0	4.8	0.9	0.0	0.0		
55	Arlington House	24 Hour Day	244.0	88.9	7.8	0.0	0.0	70	33
		Evening	38.3	13.9	1.2	0.0	0.0		
		Night	7.5	2.7	0.3	0.0	0.0		
56	Iwo Jima Memorial	24 Hour Day	339.9	118.6	23.0	7.8	0.8	77	40
		Evening	53.5	18.7	3.6	1.2	0.1		
		Night	13.4	4.6	0.9	0.3	0.0		

TABLE A-1 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

EXISTING CONDITIONS (1979)

Site No.	Description	Period	Time (Minutes) Above Indicated dBA Level 65	75	85	90	95	Ldn	NEF
57	Lady Bird Johnson Park	24 Hour Day	405.0	112.3	42.5	20.4	3.9	78	41
		Evening	64.2	17.7	6.6	3.2	0.6		
		Night	15.7	3.3	1.4	0.7	0.1		
58	Northern Virginia Regional Park	24 Hour Day	247.4	76.9	0.0	0.0	0.0	68	32
		Evening	39.0	12.0	0.0	0.0	0.0		
		Night	7.3	2.5	0.0	0.0	0.0		
	Cabin John	24 Hour Day	180.7	31.6	0.0	0.0	0.0	62	26
		Evening	28.1	4.9	0.0	0.0	0.0		
		Night	5.9	1.1	0.0	0.0	0.0		

N/A - Not Available

TABLE A-2

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

NO POLICY CHANGE (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
1	Gadsby's Tavern	24 Hour Day	540.1	173.2	39.7	8.1	0.0	75	38
		Evening	87.7	28.0	6.3	1.3	0.0		
		Night	28.5	7.5	1.3	0.2	0.0		
2	Lloyd House	24 Hour Day	361.0	113.3	0.0	0.0	0.0	70	34
		Evening	58.8	18.4	0.0	0.0	0.0		
		Night	13.6	4.0	0.0	0.0	0.0		
3	Tidal Basin	24 Hour Day	298.0	107.0	0.2	0.0	0.0	71	35
		Evening	48.5	17.2	0.0	0.0	0.0		
		Night	10.8	3.6	0.0	0.0	0.0		
4	The Lyceum	24 Hour Day	361.0	113.3	0.0	0.0	0.0	70	34
		Evening	58.8	18.4	0.0	0.0	0.0		
		Night	13.6	4.0	0.0	0.0	0.0		
5	Jones Point Lighthouse	24 Hour Day	455.3	161.3	30.5	0.0	0.0	73	37
		Evening	74.4	26.0	4.9	0.0	0.0		
		Night	20.1	5.7	1.0	0.0	0.0		
6	Arlington Memorial Bridge	24 Hour Day	435.4	197.7	39.4	8.4	0.0	76	40
		Evening	70.8	31.9	6.3	1.3	0.0		
		Night	22.6	9.4	1.3	0.3	0.0		
7	Theodore Roosevelt	24 Hour Day	437.8	174.8	36.8	4.7	0.0	75	38
		Evening	71.3	28.2	5.9	0.7	0.0		
		24 Hour Day	22.3	6.8	1.2	0.1	0.0		

TABLE A-2 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES
RESULTING FROM AIRCRAFT OPERATIONS

NO POLICY CHANGE (1990)

Site No.	Description	Period	Time (Minutes) Above Indicated dBA Level 65	75	85	90	95	Ldn	NEF
8	Georgetown Historic District	24 Hour Day	315.0	100.5	0.0	0.0	0.0	66	31
		Evening	51.2	16.1	0.0	0.0	0.0		
		Night	11.5	3.2	0.0	0.0	0.0		
9	Glover Archibold Parkway	24 Hour Day	366.1	139.0	7.6	0.0	0.0	70	35
		Evening	60.1	22.2	1.2	0.0	0.0		
		Night	15.2	4.7	0.2	0.0	0.0		
10	Arlington National Cemetery	24 Hour Day	335.0	88.0	4.2	0.0	0.0	69	33
		Evening	54.5	14.2	0.7	0.0	0.0		
		Night	11.9	3.0	0.1	0.0	0.0		
11	Arlington House - Robert E. Lee Memorial	24 Hour Day	303.2	120.3	13.1	0.0	0.0	72	35
		Evening	49.4	19.4	2.1	0.0	0.0		
		Night	11.5	4.1	0.4	0.0	0.0		
12	Ft. Myer Historic District	24 Hour Day	289.3	68.5	0.0	0.0	0.0	66	31
		Evening	47.0	11.1	0.0	0.0	0.0		
		Night	10.4	2.3	0.0	0.0	0.0		
13	Doubleday Mansion	24 Hour Day	298.8	117.5	21.8	0.0	0.0	71	35
		Evening	48.9	19.0	3.5	0.0	0.0		
		Night	12.6	4.1	0.7	0.0	0.0		
14	The Glebe	24 Hour Day	263.5	31.9	0.0	0.0	0.0	61	27
		Evening	42.9	5.1	0.0	0.0	0.0		
		Night	9.5	1.0	0.0	0.0	0.0		

TABLE A-2 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

NO POLICY CHANGE (1990)

Site No.	Description	Period	Time (Minutes) Above Indicated dBA Level 65	75	85	90	95	Ldn	NEF
15	C. R. Drew House	24 Hour Day	266.7	6.1	0.0	0.0	0.0	62	27
		Evening	42.9	1.0	0.0	0.0	0.0		
		Night	9.1	0.2	0.0	0.0	0.0		
16	Alexandria Historic District	24 Hour Day	350.3	117.7	0.8	0.0	0.0	70	34
		Evening	57.2	19.1	0.1	0.0	0.0		
		Night	13.3	4.1	0.0	0.0	0.0		
17	Bank of Alexandria	24 Hour Day	540.1	173.2	39.7	8.1	0.0	75	38
		Evening	87.7	28.0	6.3	1.3	0.0		
		Night	28.5	7.5	1.3	0.2	0.0		
18	Carlyle House	24 Hour Day	540.1	173.2	39.7	8.1	0.0	75	38
		Evening	87.7	28.0	6.3	1.3	0.0		
		Night	28.5	7.5	1.3	0.2	0.0		
19	Christ Church	24 Hour Day	361.0	113.3	0.0	0.0	0.0	70	34
		Evening	58.8	18.4	0.0	0.0	0.0		
		Night	13.6	4.0	0.0	0.0	0.0		
20	Potomac Gorge and C&O Canal	24 Hour Day	341.9	116.4	26.9	0.0	0.0	72	36
		Evening	56.1	18.7	4.3	0.0	0.0		
		Night	14.5	4.0	0.8	0.0	0.0		
21	St. Mary's Church	24 Hour Day	366.4	109.9	0.0	0.0	0.0	69	34
		Evening	59.6	17.8	0.0	0.0	0.0		
		Night	13.8	3.8	0.0	0.0	0.0		

TABLE A-2 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

NO POLICY CHANGE (1990)

Site No.	Description	Period	Time (Minutes) Above Indicated dBA Level					Ldn	NEF
			65	75	85	90	95		
22	Fort Foote Park	24 Hour Day	309.7	88.0	0.0	0.0	0.0	68	33
		Evening	50.5	14.0	0.0	0.0	0.0		
		Night	11.4	2.9	0.0	0.0	0.0		
23	Fort Foote Baptist Church	24 Hour Day	224.5	48.7	0.0	0.0	0.0	63	29
		Evening	36.2	7.8	0.0	0.0	0.0		
		Night	7.9	1.5	0.0	0.0	0.0		
24	Indian Queen School	24 Hour Day	194.4	59.8	0.0	0.0	0.0	66	30
		Evening	31.6	9.5	0.0	0.0	0.0		
		Night	7.0	1.9	0.0	0.0	0.0		
25	Brookmont School	24 Hour Day	276.9	85.0	0.0	0.0	0.0	66	30
		Evening	45.0	13.5	0.0	0.0	0.0		
		Night	10.0	2.8	0.0	0.0	0.0		
26	Sibley Hospital	24 Hour Day	277.4	96.4	0.0	0.0	0.0	68	32
		Evening	45.4	15.3	0.0	0.0	0.0		
		Night	10.2	3.2	0.0	0.0	0.0		
27	American University	24 Hour Day	245.3	25.8	0.0	0.0	0.0	61	27
		Evening	39.5	4.1	0.0	0.0	0.0		
		Night	8.4	0.8	0.0	0.0	0.0		
28	St. John's Child Dev. Center	24 Hour Day	325.9	103.3	6.2	0.0	0.0	69	34
		Evening	53.3	16.4	1.0	0.0	0.0		
		Night	12.4	3.4	0.2	0.0	0.0		

TABLE A-2 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

NO POLICY CHANGE (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
29	Georgetown University	24 Hour Day	385.9	128.0	0.0	0.0	0.0	69	33
		Evening	62.8	20.4	0.0	0.0	0.0		
		Night	14.4	4.3	0.0	0.0	0.0		
30	Woodmont School	24 Hour Day	265.2	106.1	0.0	0.0	0.0	67	32
		Evening	43.3	16.9	0.0	0.0	0.0		
		Night	9.6	3.5	0.0	0.0	0.0		
31	Columbia Hospital	24 Hour Day	291.3	24.1	0.0	0.0	0.0	61	27
		Evening	47.2	3.9	0.0	0.0	0.0		
		Night	10.3	0.8	0.0	0.0	0.0		
32	Lincoln Memorial	24 Hour Day	394.8	132.0	15.9	0.0	0.0	74	38
		Evening	64.3	21.2	2.5	0.0	0.0		
		Night	17.0	4.7	0.5	0.0	0.0		
33	Jefferson Memorial	24 Hour Day	376.0	117.7	23.4	0.9	0.0	74	37
		Evening	61.8	18.9	3.7	0.1	0.0		
		Night	15.3	4.3	0.8	0.0	0.0		
34	St. Mary's School	24 Hour Day	358.6	105.7	0.0	0.0	0.0	69	33
		Evening	58.5	17.0	0.0	0.0	0.0		
		Night	13.7	3.6	0.0	0.0	0.0		
35	Syphax School	24 Hour Day	305.5	31.9	4.9	2.9	1.2	71	34
		Evening	50.2	5.4	0.8	0.5	0.2		
		Night	12.4	1.3	0.2	0.1	0.0		

TABLE A-2 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES
RESULTING FROM AIRCRAFT OPERATIONS

NO POLICY CHANGE (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
36	Hadley Hospital	24 Hour Day	314.9	68.0	0.0	0.0	0.0	66	31
		Evening	51.3	11.0	0.0	0.0	0.0		
		Night	11.2	2.1	0.0	0.0	0.0		
37	St. Thomas More School	24 Hour Day	206.0	2.5	0.0	0.0	0.0	59	25
		Evening	33.3	0.4	0.0	0.0	0.0		
		Night	7.1	0.1	0.0	0.0	0.0		
38	Gray High School	24 Hour Day	302.0	100.7	0.0	0.0	0.0	70	34
		Evening	49.0	16.1	0.0	0.0	0.0		
		Night	10.6	3.3	0.0	0.0	0.0		
39	St. Joseph's School	24 Hour Day	350.3	117.7	0.8	0.0	0.0	70	34
		Evening	57.2	19.1	0.1	0.0	0.0		
		Night	13.3	4.1	0.0	0.0	0.0		
40	Waterfowl Sanctuary	24 Hour Day	554.9	188.5	72.9	41.0	15.5	82	44
		Evening	90.8	30.8	11.8	6.6	2.5		
		Night	28.4	7.2	2.5	1.4	0.5		
41	Gravelly Point Park	24 Hour Day	575.6	242.1	50.1	22.5	14.6	85	47
		Evening	94.1	39.3	8.1	3.6	2.3		
		Night	34.8	13.5	2.2	0.8	0.5		
42	Potomac River	24 Hour Day	N/A	N/A	N/A	N/A	N/A	73	38
		Evening							
		Night							

TABLE A-2 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

NO POLICY CHANGE (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
43	Marina	24 Hour Day Evening Night	N/A	N/A	N/A	N/A	N/A	78	43
44	Daingerfield Island	24 Hour Day	479.2	151.8	44.8	32.2	13.2	81	44
		Evening	78.2	24.6	7.1	5.1	2.1		
		Night	23.8	6.5	1.5	1.1	0.4		
45	East Potomac Park	24 Hour Day	429.4	60.1	7.3	4.0	1.9	77	40
		Evening	70.7	10.0	1.3	0.7	0.3		
		Night	17.3	2.8	0.4	0.2	0.1		
46	Jones Point Park	24 Hour Day	455.3	161.3	30.5	0.0	0.0	73	37
		Evening	74.4	26.0	4.9	0.0	0.0		
		Night	20.1	5.7	1.0	0.0	0.0		
47	West Potomac Park	24 Hour Day	448.0	186.9	40.2	17.2	3.5	79	42
		Evening	72.6	30.1	6.4	2.7	0.6		
		Night	24.1	9.0	1.5	0.6	0.1		
48	Potomac View Park	24 Hour Day	542.4	177.3	38.6	0.0	0.0	74	38
		Evening	88.1	28.6	6.2	0.0	0.0		
		Night	29.1	7.7	1.3	0.0	0.0		
49	The Mall	24 Hour Day	283.2	77.9	0.0	0.0	0.0	68	32
		Evening	46.0	12.4	0.0	0.0	0.0		
		Night	10.1	2.5	0.0	0.0	0.0		

TABLE A-2 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES
RESULTING FROM AIRCRAFT OPERATIONS

NO POLICY CHANGE (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
50	Rock Creek and Potomac Parkway	24 Hour Day	375.6	102.6	2.4	0.0	0.0	68	33
		Evening	61.0	16.4	0.4	0.0	0.0		
		Night	13.7	3.4	0.1	0.0	0.0		
51	C&O Canal	24 Hour Day	388.4	115.3	8.8	0.0	0.0	69	33
		Evening	63.2	18.4	1.4	0.0	0.0		
		Night	14.6	3.9	0.3	0.0	0.0		
52	Archibold Parkway	24 Hour Day	419.3	150.6	34.5	0.0	0.0	73	37
		Evening	68.5	24.3	5.5	0.0	0.0		
		Night	18.8	5.3	1.1	0.0	0.0		
53	Potomac Palisades Parkway	24 Hour Day	341.9	116.4	26.9	0.0	0.0	72	36
		Evening	56.1	18.7	4.3	0.0	0.0		
		Night	14.5	4.0	0.8	0.0	0.0		
54	George Washington Memorial Parkway	24 Hour Day	432.6	154.3	38.2	0.0	0.0	74	37
		Evening	70.6	24.9	6.1	0.0	0.0		
		Night	20.1	6.0	1.2	0.0	0.0		
55	Arlington House	24 Hour Day	303.2	120.3	13.1	0.0	0.0	72	35
		Evening	49.4	19.4	2.1	0.0	0.0		
		Night	11.5	4.1	0.4	0.0	0.0		
56	Iwo Jima Memorial	24 Hour Day	361.0	145.0	31.5	10.6	0.1	78	41
		Evening	58.8	23.4	5.0	1.7	0.0		
		Night	17.0	5.9	1.1	0.4	0.0		

TABLE A-2 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

NO POLICY CHANGE (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
57	Lady Bird Johnson Park	24 Hour Day	473.3	138.9	56.1	29.7	8.3	80	43
		Evening	77.3	22.6	9.0	4.7	1.3		
		Night	22.1	5.0	1.9	1.0	0.3		
58	Northern Virginia Regional Park	24 Hour Day	278.1	105.5	0.0	0.0	0.0	69	33
		Evening	45.5	16.8	0.0	0.0	0.0		
		Night	10.4	3.5	0.0	0.0	0.0		
	Cabin John	24 Hour Day	201.1	46.5	0.0	0.0	0.0	63	28
		Evening	32.0	7.4	0.0	0.0	0.0		
		Night	6.7	1.5	0.0	0.0	0.0		

N/A - Not Available.

TABLE A-3

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

EXPANDED GROWTH POLICY AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
1	Gadsby's Tavern	24 Hour Day	452.4	146.0	29.2	5.6	0.0	74	38
		Evening	67.0	21.7	4.4	0.8	0.0		
		Night	29.2	8.1	1.4	0.3	0.0		
2	Lloyd House	24 Hour Day	295.2	85.7	0.0	0.0	0.0	69	33
		Evening	44.9	13.0	0.0	0.0	0.0		
		Night	15.1	4.1	0.0	0.0	0.0		
3	Tidal Basin	24 Hour Day	241.6	77.0	0.1	0.0	0.0	70	34
		Evening	36.9	11.6	0.0	0.0	0.0		
		Night	11.8	3.7	0.0	0.0	0.0		
4	The Lyceum	24 Hour Day	295.2	85.7	0.0	0.0	0.0	69	33
		Evening	44.9	13.0	0.0	0.0	0.0		
		Night	15.1	4.1	0.0	0.0	0.0		
5	Jones Point Lighthouse	24 Hour Day	381.7	132.1	21.1	0.0	0.0	72	36
		Evening	58.1	19.9	3.2	0.0	0.0		
		Night	22.0	6.5	1.0	0.0	0.0		
6	Arlington Memorial Bridge	24 Hour Day	370.8	164.9	29.2	6.0	0.0	76	39
		Evening	55.6	24.5	4.4	0.9	0.0		
		Night	23.5	9.7	1.4	0.3	0.0		
7	Theodore Roosevelt	24 Hour Day	375.5	145.2	26.4	3.2	0.0	74	38
		Evening	56.5	21.9	4.0	0.5	0.0		
		24 Hour Day	23.5	7.6	1.3	0.2	0.0		

TABLE A-3 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

EXPANDED GROWTH POLICY AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
8	Georgetown Historic District	24 Hour Day	259.6	70.3	0.0	0.0	0.0	65	30
		Evening	39.5	10.6	0.0	0.0	0.0		
		Night	12.8	3.3	0.0	0.0	0.0		
9	Glover Archibold Parkway	24 Hour Day	310.3	104.2	5.2	0.0	0.0	70	34
		Evening	47.7	15.7	0.8	0.0	0.0		
		Night	16.9	5.1	0.2	0.0	0.0		
10	Arlington National Cemetery	24 Hour Day	264.8	63.0	2.8	0.0	0.0	68	32
		Evening	40.4	9.6	0.4	0.0	0.0		
		Night	12.9	3.0	0.1	0.0	0.0		
11	Arlington House - Robert E. Lee Memorial	24 Hour Day	250.7	89.5	8.9	0.0	0.0	71	34
		Evening	38.2	13.6	1.3	0.0	0.0		
		Night	12.8	4.3	0.4	0.0	0.0		
12	Ft. Myer Historic District	24 Hour Day	228.6	48.9	0.0	0.0	0.0	65	30
		Evening	34.9	7.4	0.0	0.0	0.0		
		Night	11.2	2.4	0.0	0.0	0.0		
13	Doubleday Mansion	24 Hour Day	256.4	92.9	15.3	0.0	0.0	71	35
		Evening	39.0	14.1	2.3	0.0	0.0		
		Night	14.1	4.5	0.8	0.0	0.0		
14	The Glebe	24 Hour Day	195.2	21.4	0.0	0.0	0.0	60	26
		Evening	29.9	3.2	0.0	0.0	0.0		
		Night	9.5	1.0	0.0	0.0	0.0		

TABLE A-3 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

EXPANDED GROWTH POLICY AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
15	C. R. Drew House	24 Hour Day	193.2	4.2	0.0	0.0	0.0	61	26
		Evening	29.2	0.6	0.0	0.0	0.0		
		Night	9.3	0.2	0.0	0.0	0.0		
16	Alexandria Historic District	24 Hour Day	284.9	90.0	0.6	0.0	0.0	69	33
		Evening	43.4	13.7	0.1	0.0	0.0		
		Night	14.6	4.3	0.0	0.0	0.0		
17	Bank of Alexandria	24 Hour Day	452.4	146.0	29.2	5.6	0.0	74	38
		Evening	67.0	21.7	4.4	0.8	0.0		
		Night	29.2	8.1	1.4	0.3	0.0		
18	Carlyle House	24 Hour Day	452.4	146.0	29.2	5.6	0.0	74	38
		Evening	67.0	21.7	4.4	0.8	0.0		
		Night	29.2	8.1	1.4	0.3	0.0		
19	Christ Church	24 Hour Day	295.2	85.7	0.0	0.0	0.0	69	33
		Evening	44.9	13.0	0.0	0.0	0.0		
		Night	15.1	4.1	0.0	0.0	0.0		
20	Potomac Gorge and C&O Canal	24 Hour Day	288.2	92.6	18.3	0.0	0.0	71	35
		Evening	44.2	14.0	2.7	0.0	0.0		
		Night	16.0	4.5	0.9	0.0	0.0		
21	St. Mary's Church	24 Hour Day	301.7	82.0	0.0	0.0	0.0	69	33
		Evening	45.9	12.4	0.0	0.0	0.0		
		Night	15.4	4.0	0.0	0.0	0.0		

TABLE A-3 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

EXPANDED GROWTH POLICY AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
22	Fort Foote Park	24 Hour Day	250.4	65.2	0.0	0.0	0.0	68	32
		Evening	38.4	9.7	0.0	0.0	0.0		
		Night	12.6	3.1	0.0	0.0	0.0		
23	Fort Foote Baptist Church	24 Hour Day	179.1	33.3	0.0	0.0	0.0	62	28
		Evening	27.1	5.0	0.0	0.0	0.0		
		Night	8.7	1.6	0.0	0.0	0.0		
24	Indian Queen School	24 Hour Day	154.5	43.3	0.0	0.0	0.0	65	29
		Evening	23.5	6.5	0.0	0.0	0.0		
		Night	7.6	2.1	0.0	0.0	0.0		
25	Brookmont School	24 Hour Day	224.3	61.2	0.0	0.0	0.0	65	30
		Evening	34.2	9.2	0.0	0.0	0.0		
		Night	11.1	3.0	0.0	0.0	0.0		
26	Sibley Hospital	24 Hour Day	229.9	70.2	0.0	0.0	0.0	67	31
		Evening	35.3	10.5	0.0	0.0	0.0		
		Night	11.4	3.4	0.0	0.0	0.0		
27	American University	24 Hour Day	183.8	17.5	0.0	0.0	0.0	60	26
		Evening	27.8	2.6	0.0	0.0	0.0		
		Night	8.9	0.8	0.0	0.0	0.0		
28	St. John's Child Dev. Center	24 Hour Day	268.7	77.1	4.2	0.0	0.0	69	33
		Evening	41.4	11.5	0.6	0.0	0.0		
		Night	13.9	3.7	0.2	0.0	0.0		

TABLE A-3 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

EXPANDED GROWTH POLICY AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
29	Georgetown University	24 Hour Day	321.4	94.3	0.0	0.0	0.0	68	32
		Evening	49.2	14.1	0.0	0.0	0.0		
		Night	16.3	4.6	0.0	0.0	0.0		
30	Woodmont School	24 Hour Day	222.2	77.5	0.0	0.0	0.0	66	31
		Evening	33.9	11.6	0.0	0.0	0.0		
		Night	10.9	3.7	0.0	0.0	0.0		
31	Columbia Hospital	24 Hour Day	216.8	16.2	0.0	0.0	0.0	60	26
		Evening	33.1	2.4	0.0	0.0	0.0		
		Night	10.5	0.8	0.0	0.0	0.0		
32	Lincoln Memorial	24 Hour Day	330.0	104.1	11.1	0.0	0.0	73	37
		Evening	50.0	15.6	1.7	0.0	0.0		
		Night	18.3	5.2	0.5	0.0	0.0		
33	Jefferson Memorial	24 Hour Day	310.0	91.7	16.2	0.6	0.0	73	36
		Evening	47.6	13.8	2.4	0.1	0.0		
		Night	16.3	4.6	0.8	0.0	0.0		
34	St. Mary's School	24 Hour Day	298.6	78.2	0.0	0.0	0.0	68	33
		Evening	45.5	11.8	0.0	0.0	0.0		
		Night	15.3	3.8	0.0	0.0	0.0		
35	Syphax School	24 Hour Day	222.2	24.8	4.1	2.1	0.8	70	33
		Evening	34.2	3.9	0.6	0.3	0.1		
		Night	12.0	1.2	0.2	0.1	0.0		

TABLE A-3 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

EXPANDED GROWTH POLICY AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
36	Hadley Hospital	24 Hour Day	238.8	46.0	0.0	0.0	0.0	65	30
		Evening	36.5	7.0	0.0	0.0	0.0		
		Night	11.5	2.1	0.0	0.0	0.0		
37	St. Thomas More School	24 Hour Day	149.4	1.7	0.0	0.0	0.0	58	24
		Evening	22.7	0.3	0.0	0.0	0.0		
		Night	7.0	0.1	0.0	0.0	0.0		
38	Gray High School	24 Hour Day	239.8	72.9	0.0	0.0	0.0	69	33
		Evening	36.4	10.9	0.0	0.0	0.0		
		Night	11.6	3.5	0.0	0.0	0.0		
39	St. Joseph's School	24 Hour Day	284.9	90.0	0.6	0.0	0.0	69	33
		Evening	43.4	13.7	0.1	0.0	0.0		
		Night	14.6	4.3	0.0	0.0	0.0		
40	Waterfowl Sanctuary	24 Hour Day	471.4	153.3	55.9	29.8	10.8	81	44
		Evening	70.8	23.4	8.5	4.5	1.6		
		Night	29.1	7.8	2.7	1.4	0.5		
41	Gravelly Point Park	24 Hour Day	488.8	200.2	41.5	18.5	11.1	84	46
		Evening	72.1	29.4	6.2	2.8	1.7		
		Night	33.5	13.0	2.3	0.9	0.5		
42	Potomac River	24 Hour Day	N/A	N/A	N/A	N/A	N/A	72	37
		Evening							
		Night							

TABLE A-3 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES
RESULTING FROM AIRCRAFT OPERATIONS

EXPANDED GROWTH POLICY AT NATIONAL (1990)

Site No.	Description	Period	Time (Minutes) Above Indicated dBA Level					Ldn	NEF
			65	75	85	90	95		
43	Marina	24 Hour Day	N/A	N/A	N/A	N/A	N/A	77	42
		Evening							
		Night							
44	Daingerfield Island	24 Hour Day	394.8	132.3	36.8	23.4	8.9	80	43
		Evening	59.3	19.8	5.5	3.5	1.3		
		Night	24.5	7.2	1.8	1.1	0.4		
45	East Potomac Park	24 Hour Day	331.5	45.7	6.2	3.4	1.5	76	39
		Evening	51.1	7.1	1.0	0.5	0.2		
		Night	17.4	2.6	0.3	0.2	0.1		
46	Jones Point Park	24 Hour Day	381.7	132.1	21.1	0.0	0.0	69	33
		Evening	58.1	19.9	3.2	0.0	0.0		
		Night	22.0	6.5	1.0	0.0	0.0		
47	West Potomac Park	24 Hour Day	380.1	155.4	31.9	12.2	2.4	78	42
		Evening	56.5	23.1	4.7	1.8	0.4		
		Night	24.5	9.2	1.7	0.6	0.1		
48	Potomac View Park	24 Hour Day	457.8	149.0	28.2	0.0	0.0	74	37
		Evening	67.7	22.1	4.2	0.0	0.0		
		Night	29.7	8.3	1.4	0.0	0.0		
49	The Mall	24 Hour Day	219.7	54.1	0.0	0.0	0.0	67	31
		Evening	33.4	8.1	0.0	0.0	0.0		
		Night	10.7	2.6	0.0	0.0	0.0		

TABLE A-3 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

EXPANDED GROWTH POLICY AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
50	Rock Creek and Potomac Parkway	24 Hour Day	308.4	74.3	1.6	0.0	0.0	67	32
		Evening	47.1	11.2	0.2	0.0	0.0		
		Night	15.4	3.6	0.1	0.0	0.0		
51	C&O Canal	24 Hour Day	323.0	86.3	6.0	0.0	0.0	68	32
		Evening	49.4	12.9	0.9	0.0	0.0		
		Night	16.5	4.2	0.3	0.0	0.0		
52	Archibold Parkway	24 Hour Day	355.5	123.0	23.8	0.0	0.0	72	36
		Evening	54.1	18.6	3.6	0.0	0.0		
		Night	20.5	6.0	1.2	0.0	0.0		
53	Potomac Palisades Parkway	24 Hour Day	288.2	92.6	18.3	0.0	0.0	71	35
		Evening	44.2	14.0	2.7	0.0	0.0		
		Night	16.0	4.5	0.9	0.0	0.0		
54	George Washington Memorial Parkway	24 Hour Day	367.8	127.5	26.9	0.0	0.0	73	37
		Evening	55.9	19.3	4.0	0.0	0.0		
		Night	21.8	6.6	1.3	0.0	0.0		
55	Arlington House	24 Hour Day	250.7	89.5	8.9	0.0	0.0	71	34
		Evening	38.2	13.6	1.3	0.0	0.0		
		Night	12.8	4.3	0.4	0.0	0.0		
56	Iwo Jima Memorial	24 Hour Day	306.3	117.4	24.7	7.9	0.1	77	40
		Evening	46.0	17.6	3.7	1.2	0.0		
		Night	18.2	6.2	1.3	0.4	0.0		

TABLE A-3 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

EXPANDED GROWTH POLICY AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
57	Lady Bird Johnson Park	24 Hour Day	388.1	117.5	43.2	21.1	5.6	79	42
		Evening	58.7	17.8	6.5	3.2	0.8		
		Night	23.0	5.8	2.1	1.0	0.3		
58	Northern Virginia Regional Park	24 Hour Day	233.9	77.2	0.0	0.0	0.0	68	32
		Evening	35.9	11.5	0.0	0.0	0.0		
		Night	11.7	3.7	0.0	0.0	0.0		
	Cabin John	24 Hour Day	155.7	32.8	0.0	0.0	0.0	62	27
		Evening	23.3	4.9	0.0	0.0	0.0		
		Night	7.6	1.6	0.0	0.0	0.0		

N/A - Not Available.

TABLE A-4

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

CONTROLLED GROWTH POLICY TO 18 MILLION PASSENGERS AT NATIONAL (1990)

Site No.	Description	Period	Time (Minutes) Above Indicated dBA Level 65	75	85	90	95	Ldn	NEF
1	Gadsby's Tavern	24 Hour Day	434.7	124.0	18.9	3.4	0.0	71	34
		Evening	86.8	24.3	3.6	0.7	0.0		
		Night	3.1	0.7	0.0	0.0	0.0		
2	Lloyd House	24 Hour Day	221.2	60.3	0.0	0.0	0.0	65	29
		Evening	43.4	11.8	0.0	0.0	0.0		
		Night	0.6	0.2	0.0	0.0	0.0		
3	Tidal Basin	24 Hour Day	180.4	51.3	0.1	0.0	0.0	66	29
		Evening	35.4	10.0	0.0	0.0	0.0		
		Night	0.5	0.1	0.0	0.0	0.0		
4	The Lyceum	24 Hour Day	221.2	60.3	0.0	0.0	0.0	65	29
		Evening	43.4	11.8	0.0	0.0	0.0		
		Night	0.6	0.2	0.0	0.0	0.0		
5	Jones Point Lighthouse	24 Hour Day	318.6	95.0	12.9	0.0	0.0	69	32
		Evening	62.7	18.4	2.5	0.0	0.0		
		Night	1.9	0.3	0.0	0.0	0.0		
6	Arlington Memorial Bridge	24 Hour Day	351.6	151.3	19.2	3.8	0.0	72	35
		Evening	70.3	30.2	3.7	0.7	0.0		
		Night	2.4	1.0	0.0	0.0	0.0		
7	Theodore Roosevelt	24 Hour Day	353.8	115.4	17.0	2.0	0.0	71	34
		Evening	70.6	22.6	3.3	0.4	0.0		
		24 Hour Day	2.3	0.6	0.0	0.0	0.0		

TABLE A-4 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

CONTROLLED GROWTH POLICY TO 18 MILLION PASSENGERS AT NATIONAL (1990)

Site No.	Description	Period	Time (Minutes) Above Indicated dBA Level 65	75	85	90	95	Ldn	NEF
8	Georgetown Historic District	24 Hour Day	195.8	44.3	0.0	0.0	0.0	62	26
		Evening	38.3	8.5	0.0	0.0	0.0		
		Night	0.6	0.0	0.0	0.0	0.0		
9	Glover Archibold Parkway	24 Hour Day	258.9	70.6	3.1	0.0	0.0	66	30
		Evening	51.0	13.6	0.6	0.0	0.0		
		Night	1.4	0.1	0.0	0.0	0.0		
10	Arlington National Cemetery	24 Hour Day	194.0	42.3	1.7	0.0	0.0	65	28
		Evening	38.0	8.3	0.3	0.0	0.0		
		Night	0.6	0.1	0.0	0.0	0.0		
11	Arlington House - Robert E. Lee Memorial	24 Hour Day	192.7	61.8	5.3	0.0	0.0	67	30
		Evening	37.9	12.1	1.0	0.0	0.0		
		Night	0.6	0.1	0.0	0.0	0.0		
12	Ft. Myer Historic District	24 Hour Day	168.5	32.3	0.0	0.0	0.0	62	26
		Evening	33.0	6.3	0.0	0.0	0.0		
		Night	0.6	0.0	0.0	0.0	0.0		
13	Doubleday Mansion	24 Hour Day	209.6	66.8	9.6	0.0	0.0	67	30
		Evening	41.4	13.0	1.9	0.0	0.0		
		Night	0.7	0.2	0.0	0.0	0.0		
14	The Glebe	24 Hour Day	139.9	13.0	0.0	0.0	0.0	57	22
		Evening	27.5	2.5	0.0	0.0	0.0		
		Night	0.5	0.0	0.0	0.0	0.0		

TABLE A-4 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

CONTROLLED GROWTH POLICY TO 18 MILLION PASSENGERS AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
15	C. R. Drew House	24 Hour Day	130.2	2.5	0.0	0.0	0.0	57	22
		Evening	25.3	0.5	0.0	0.0	0.0		
		Night	0.2	0.0	0.0	0.0	0.0		
16	Alexandria Historic District	24 Hour Day	214.1	63.6	0.3	0.0	0.0	66	29
		Evening	42.1	12.4	0.1	0.0	0.0		
		Night	0.6	0.2	0.0	0.0	0.0		
17	Bank of Alexandria	24 Hour Day	434.7	124.0	18.9	3.4	0.0	71	34
		Evening	86.8	24.3	3.6	0.7	0.0		
		Night	3.1	0.7	0.0	0.0	0.0		
18	Carlyle House	24 Hour Day	434.7	124.0	18.9	3.4	0.0	71	34
		Evening	86.8	24.3	3.6	0.7	0.0		
		Night	3.1	0.7	0.0	0.0	0.0		
19	Christ Church	24 Hour Day	221.2	60.3	0.0	0.0	0.0	65	29
		Evening	43.4	11.8	0.0	0.0	0.0		
		Night	0.6	0.2	0.0	0.0	0.0		
20	Potomac Gorge and C&O Canal	24 Hour Day	237.3	66.0	11.1	0.0	0.0	68	31
		Evening	46.7	12.8	2.2	0.0	0.0		
		Night	1.1	0.1	0.0	0.0	0.0		
21	St. Mary's Church	24 Hour Day	226.4	56.8	0.0	0.0	0.0	65	28
		Evening	44.3	11.1	0.0	0.0	0.0		
		Night	0.6	0.1	0.0	0.0	0.0		

TABLE A-4 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES
RESULTING FROM AIRCRAFT OPERATIONS

CONTROLLED GROWTH POLICY TO 18 MILLION PASSENGERS AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
22	Fort Foote Park	24 Hour Day	187.6	42.3	0.0	0.0	0.0	64	28
		Evening	36.6	8.1	0.0	0.0	0.0		
		Night	0.8	0.0	0.0	0.0	0.0		
23	Fort Foote Baptist Church	24 Hour Day	128.9	20.1	0.0	0.0	0.0	59	23
		Evening	25.3	3.9	0.0	0.0	0.0		
		Night	0.3	0.0	0.0	0.0	0.0		
24	Indian Queen School	24 Hour Day	113.4	27.5	0.0	0.0	0.0	61	25
		Evening	22.3	5.3	0.0	0.0	0.0		
		Night	0.3	0.0	0.0	0.0	0.0		
25	Brookmont School	24 Hour Day	167.1	39.3	0.0	0.0	0.0	62	25
		Evening	32.8	7.6	0.0	0.0	0.0		
		Night	0.6	0.0	0.0	0.0	0.0		
26	Sibley Hospital	24 Hour Day	176.7	45.5	0.0	0.0	0.0	63	27
		Evening	34.7	8.7	0.0	0.0	0.0		
		Night	0.7	0.0	0.0	0.0	0.0		
27	American University	24 Hour Day	127.1	10.5	0.0	0.0	0.0	57	21
		Evening	24.7	2.1	0.0	0.0	0.0		
		Night	0.2	0.0	0.0	0.0	0.0		
28	St. John's Child Dev. Center	24 Hour Day	208.0	50.9	2.5	0.0	0.0	65	29
		Evening	40.7	9.8	0.5	0.0	0.0		
		Night	0.9	0.0	0.0	0.0	0.0		

TABLE A-4 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

CONTROLLED GROWTH POLICY TO 18 MILLION PASSENGERS AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
29	Georgetown University	24 Hour Day	248.9	62.2	0.0	0.0	0.0	65	28
		Evening	48.5	11.9	0.0	0.0	0.0		
		Night	1.2	0.0	0.0	0.0	0.0		
30	Woodmont School	24 Hour Day	169.5	50.3	0.0	0.0	0.0	63	27
		Evening	33.3	9.7	0.0	0.0	0.0		
		Night	0.6	0.0	0.0	0.0	0.0		
31	Columbia Hospital	24 Hour Day	154.2	9.8	0.0	0.0	0.0	57	22
		Evening	30.2	1.9	0.0	0.0	0.0		
		Night	0.5	0.0	0.0	0.0	0.0		
32	Lincoln Memorial	24 Hour Day	281.5	75.5	6.9	0.0	0.0	70	33
		Evening	55.4	14.7	1.3	0.0	0.0		
		Night	1.6	0.2	0.0	0.0	0.0		
33	Jefferson Memorial	24 Hour Day	253.2	67.7	10.2	0.4	0.0	69	32
		Evening	50.0	13.2	1.9	0.1	0.0		
		Night	1.4	0.2	0.0	0.0	0.0		
34	St. Mary's School	24 Hour Day	228.7	53.2	0.0	0.0	0.0	65	28
		Evening	44.9	10.3	0.0	0.0	0.0		
		Night	0.7	0.1	0.0	0.0	0.0		
35	Syphax School	24 Hour Day	163.6	20.8	3.4	1.3	0.5	67	29
		Evening	32.8	4.3	0.7	0.3	0.1		
		Night	0.8	0.2	0.0	0.0	0.0		

TABLE A-4 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

CONTROLLED GROWTH POLICY TO 18 MILLION PASSENGERS AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
36	Hadley Hospital	24 Hour Day	170.7	27.6	0.0	0.0	0.0	62	25
		Evening	33.7	5.4	0.0	0.0	0.0		
		Night	0.6	0.0	0.0	0.0	0.0		
37	St. Thomas More School	24 Hour Day	100.2	1.0	0.0	0.0	0.0	55	20
		Evening	19.6	0.2	0.0	0.0	0.0		
		Night	0.2	0.0	0.0	0.0	0.0		
38	Gray High School	24 Hour Day	172.2	47.2	0.0	0.0	0.0	65	28
		Evening	33.7	9.1	0.0	0.0	0.0		
		Night	0.4	0.0	0.0	0.0	0.0		
39	St. Joseph's School	24 Hour Day	214.1	63.6	0.3	0.0	0.0	66	29
		Evening	42.1	12.4	0.1	0.0	0.0		
		Night	0.6	0.2	0.0	0.0	0.0		
40	Waterfowl Sanctuary	24 Hour Day	443.8	117.6	39.3	19.8	6.8	77	40
		Evening	88.7	23.1	7.7	3.8	1.3		
		Night	3.0	0.4	0.1	0.0	0.0		
41	Gravelly Point Park	24 Hour Day	525.4	205.6	35.4	13.4	7.5	80	42
		Evening	106.1	41.2	7.0	2.6	1.4		
		Night	4.4	1.6	0.2	0.0	0.0		
42	Potomac River	24 Hour Day Evening Night	N/A	N/A	N/A	N/A	N/A	75	30

TABLE A-4 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

CONTROLLED GROWTH POLICY TO 18 MILLION PASSENGERS AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
43	Marina	24 Hour Day Evening Night	N/A	N/A	N/A	N/A	N/A	73	38
44	Daingerfield Island	24 Hour Day	357.0	112.1	25.7	15.0	5.4	76	39
		Evening	70.9	22.0	5.0	2.9	1.0		
		Night	2.4	0.6	0.0	0.0	0.0		
45	East Potomac Park	24 Hour Day	255.3	36.6	6.1	3.0	1.0	73	35
		Evening	51.0	7.4	1.3	0.6	0.2		
		Night	1.3	0.2	0.1	0.0	0.0		
46	Jones Point Park	24 Hour Day	318.6	95.0	12.9	0.0	0.0	69	32
		Evening	62.7	18.4	2.5	0.0	0.0		
		Night	1.9	0.3	0.0	0.0	0.0		
47	West Potomac Park	24 Hour Day	369.5	144.7	23.9	7.8	1.4	75	37
		Evening	73.9	29.0	4.6	1.5	0.3		
		Night	2.6	1.0	0.0	0.0	0.0		
48	Potomac View Park	24 Hour Day	447.2	127.4	18.2	0.0	0.0	70	33
		Evening	89.4	25.0	3.5	0.0	0.0		
		Night	3.2	0.7	0.0	0.0	0.0		
49	The Mall	24 Hour Day	158.5	33.8	0.0	0.0	0.0	63	26
		Evening	31.1	6.5	0.0	0.0	0.0		
		Night	0.5	0.0	0.0	0.0	0.0		

TABLE A-4 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

CONTROLLED GROWTH POLICY TO 18 MILLION PASSENGERS AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
50	Rock Creek and Potomac Parkway	24 Hour Day	232.1	48.9	1.0	0.0	0.0	64	28
		Evening	45.2	9.5	0.2	0.0	0.0		
		Night	0.9	0.0	0.0	0.0	0.0		
51	C&O Canal	24 Hour Day	251.0	57.8	3.6	0.0	0.0	65	28
		Evening	49.0	11.1	0.7	0.0	0.0		
		Night	1.2	0.0	0.0	0.0	0.0		
52	Archibold Parkway	24 Hour Day	305.7	89.8	14.7	0.0	0.0	69	32
		Evening	60.3	17.4	2.8	0.0	0.0		
		Night	1.8	0.3	0.0	0.0	0.0		
53	Potomac Palisades Parkway	24 Hour Day	237.3	66.0	11.1	0.0	0.0	68	31
		Evening	46.7	12.8	2.2	0.0	0.0		
		Night	1.1	0.1	0.0	0.0	0.0		
54	George Washington Memorial Parkway	24 Hour Day	324.3	100.6	16.9	0.0	0.0	70	33
		Evening	64.2	19.8	3.3	0.0	0.0		
		Night	1.9	0.4	0.0	0.0	0.0		
55	Arlington House	24 Hour Day	192.7	61.8	5.3	0.0	0.0	67	30
		Evening	37.9	12.1	1.0	0.0	0.0		
		Night	0.6	0.1	0.0	0.0	0.0		
56	Iwo Jima Memorial	24 Hour Day	265.8	96.1	17.6	5.2	0.1	73	36
		Evening	52.7	18.9	3.4	1.0	0.0		
		Night	1.2	0.4	0.0	0.0	0.0		

TABLE A-4 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

CONTROLLED GROWTH POLICY TO 18 MILLION PASSENGERS AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
57	Lady Bird Johnson Park	24 Hour Day	335.5	89.0	29.6	13.5	3.4	75	38
		Evening	66.7	17.4	5.7	2.6	0.7		
		Night	1.9	0.3	0.0	0.0	0.0		
58	Northern Virginia Regional Park	24 Hour Day	181.2	50.2	0.0	0.0	0.0	65	28
		Evening	35.6	9.6	0.0	0.0	0.0		
		Night	0.6	0.0	0.0	0.0	0.0		
	Cabin John	24 Hour Day	105.0	20.6	0.0	0.0	0.0	58	23
		Evening	20.2	4.0	0.0	0.0	0.0		
		Night	0.0	0.0	0.0	0.0	0.0		

N/A - Not Available.

TABLE A-5

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES
RESULTING FROM AIRCRAFT OPERATIONS

CONTROLLED GROWTH POLICY TO 16 MILLION PASSENGERS AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
1	Gadsby's Tavern	24 Hour Day	381.8	110.2	16.4	3.0	0.0	70	33
		Evening	80.1	22.9	3.4	0.6	0.0		
		Night	1.2	0.4	0.0	0.0	0.0		
2	Lloyd House	24 Hour Day	193.1	53.3	0.0	0.0	0.0	65	28
		Evening	40.2	11.0	0.0	0.0	0.0		
		Night	0.6	0.2	0.0	0.0	0.0		
3	Tidal Basin	24 Hour Day	158.6	44.8	0.1	0.0	0.0	66	29
		Evening	33.1	9.2	0.0	0.0	0.0		
		Night	0.5	0.1	0.0	0.0	0.0		
4	The Lyceum	24 Hour Day	193.1	53.3	0.0	0.0	0.0	65	28
		Evening	40.2	11.0	0.0	0.0	0.0		
		Night	0.6	0.2	0.0	0.0	0.0		
5	Jones Point Lighthouse	24 Hour Day	277.5	83.7	11.3	0.0	0.0	69	32
		Evening	57.9	17.3	2.3	0.0	0.0		
		Night	1.3	0.3	0.0	0.0	0.0		
6	Arlington Memorial Bridge	24 Hour Day	307.8	133.8	16.5	3.3	0.0	72	35
		Evening	65.3	28.4	3.4	0.7	0.0		
		Night	1.2	0.4	0.0	0.0	0.0		
7	Theodore Roosevelt	24 Hour Day	308.9	102.0	14.6	1.7	0.0	70	33
		Evening	65.5	21.3	3.0	0.3	0.0		
		24 Hour Day	1.2	0.4	0.0	0.0	0.0		

TABLE A-5 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

CONTROLLED GROWTH POLICY TO 16 MILLION PASSENGERS AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
8	Georgetown Historic District	24 Hour Day	172.8	38.2	0.0	0.0	0.0	61	25
		Evening	36.2	7.8	0.0	0.0	0.0		
		Night	0.6	0.0	0.0	0.0	0.0		
9	Glover Archibold Parkway	24 Hour Day	224.7	61.4	2.7	0.0	0.0	66	29
		Evening	47.2	12.7	0.5	0.0	0.0		
		Night	1.1	0.1	0.0	0.0	0.0		
10	Arlington National Cemetery	24 Hour Day	170.6	37.0	1.5	0.0	0.0	64	27
		Evening	35.4	7.6	0.3	0.0	0.0		
		Night	0.6	0.1	0.0	0.0	0.0		
11	Arlington House - Robert E. Lee Memorial	24 Hour Day	169.5	54.2	4.6	0.0	0.0	67	29
		Evening	35.4	11.2	0.9	0.0	0.0		
		Night	0.6	0.1	0.0	0.0	0.0		
12	Ft. Myer Historic District	24 Hour Day	149.3	28.2	0.0	0.0	0.0	61	25
		Evening	31.1	5.8	0.0	0.0	0.0		
		Night	0.6	0.0	0.0	0.0	0.0		
13	Doubleday Mansion	24 Hour Day	183.2	58.8	8.3	0.0	0.0	67	30
		Evening	38.5	12.2	1.7	0.0	0.0		
		Night	0.6	0.2	0.0	0.0	0.0		
14	The Glebe	24 Hour Day	124.3	11.2	0.0	0.0	0.0	56	21
		Evening	25.8	2.3	0.0	0.0	0.0		
		Night	0.5	0.0	0.0	0.0	0.0		

TABLE A-5 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES
RESULTING FROM AIRCRAFT OPERATIONS

CONTROLLED GROWTH POLICY TO 16 MILLION PASSENGERS AT NATIONAL (1990)

Site No.	Description	Period	Time (Minutes) Above Indicated dBA Level 65	75	85	90	95	Ldn	NEF
15	C. R. Drew House	24 Hour Day	113.8	2.2	0.0	0.0	0.0	57	21
		Evening	23.5	0.4	0.0	0.0	0.0		
		Night	0.2	0.0	0.0	0.0	0.0		
16	Alexandria Historic District	24 Hour Day	187.1	56.2	0.3	0.0	0.0	65	28
		Evening	39.0	11.6	0.1	0.0	0.0		
		Night	0.6	0.2	0.0	0.0	0.0		
17	Bank of Alexandria	24 Hour Day	381.8	110.2	16.4	3.0	0.0	70	33
		Evening	80.1	22.9	3.4	0.6	0.0		
		Night	1.2	0.4	0.0	0.0	0.0		
18	Carlyle House	24 Hour Day	381.8	110.2	16.4	3.0	0.0	70	33
		Evening	80.1	22.9	3.4	0.6	0.0		
		Night	1.2	0.4	0.0	0.0	0.0		
19	Christ Church	24 Hour Day	193.1	53.3	0.0	0.0	0.0	65	28
		Evening	40.2	11.0	0.0	0.0	0.0		
		Night	0.6	0.2	0.0	0.0	0.0		
20	Potomac Gorge and C&O Canal	24 Hour Day	206.5	57.8	9.6	0.0	0.0	67	30
		Evening	43.4	12.0	1.9	0.0	0.0		
		Night	0.9	0.1	0.0	0.0	0.0		
21	St. Mary's Church	24 Hour Day	197.7	50.2	0.0	0.0	0.0	65	28
		Evening	41.2	10.4	0.0	0.0	0.0		
		Night	0.6	0.1	0.0	0.0	0.0		

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TABLE A-5 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

CONTROLLED GROWTH POLICY TO 16 MILLION PASSENGERS AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
22	Fort Foote Park	24 Hour Day	164.1	36.7	0.0	0.0	0.0	64	27
		Evening	34.1	7.5	0.0	0.0	0.0		
		Night	0.8	0.0	0.0	0.0	0.0		
23	Fort Foote Baptist Church	24 Hour Day	113.8	17.4	0.0	0.0	0.0	58	23
		Evening	23.7	3.5	0.0	0.0	0.0		
		Night	0.3	0.0	0.0	0.0	0.0		
24	Indian Queen School	24 Hour Day	99.9	23.9	0.0	0.0	0.0	61	24
		Evening	20.8	4.9	0.0	0.0	0.0		
		Night	0.3	0.0	0.0	0.0	0.0		
25	Brookmont School	24 Hour Day	148.0	34.0	0.0	0.0	0.0	61	25
		Evening	30.8	6.9	0.0	0.0	0.0		
		Night	0.6	0.0	0.0	0.0	0.0		
26	Sibley Hospital	24 Hour Day	156.0	39.3	0.0	0.0	0.0	63	26
		Evening	32.6	8.1	0.0	0.0	0.0		
		Night	0.7	0.0	0.0	0.0	0.0		
27	American University	24 Hour Day	111.3	9.1	0.0	0.0	0.0	56	21
		Evening	23.0	1.8	0.0	0.0	0.0		
		Night	0.2	0.0	0.0	0.0	0.0		
28	St. John's Child Dev. Center	24 Hour Day	182.6	43.9	2.2	0.0	0.0	65	28
		Evening	38.1	9.0	0.4	0.0	0.0		
		Night	0.9	0.0	0.0	0.0	0.0		

TABLE A-5 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

CONTROLLED GROWTH POLICY TO 16 MILLION PASSENGERS AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
29	Georgetown University	24 Hour Day	217.5	53.8	0.0	0.0	0.0	64	28
		Evening	45.4	11.1	0.0	0.0	0.0		
		Night	1.0	0.0	0.0	0.0	0.0		
30	Woodmont School	24 Hour Day	149.9	43.5	0.0	0.0	0.0	63	26
		Evening	31.3	8.9	0.0	0.0	0.0		
		Night	0.6	0.0	0.0	0.0	0.0		
31	Columbia Hospital	24 Hour Day	136.4	8.4	0.0	0.0	0.0	56	21
		Evening	28.3	1.7	0.0	0.0	0.0		
		Night	0.5	0.0	0.0	0.0	0.0		
32	Lincoln Memorial	24 Hour Day	246.0	66.2	6.0	0.0	0.0	69	32
		Evening	51.6	13.8	1.2	0.0	0.0		
		Night	1.0	0.1	0.0	0.0	0.0		
33	Jefferson Memorial	24 Hour Day	223.1	59.3	8.7	0.3	0.0	69	31
		Evening	46.7	12.3	1.8	0.1	0.0		
		Night	1.2	0.1	0.0	0.0	0.0		
34	St. Mary's School	24 Hour Day	200.8	46.7	0.0	0.0	0.0	64	28
		Evening	42.0	9.6	0.0	0.0	0.0		
		Night	0.7	0.1	0.0	0.0	0.0		
35	Syphax School	24 Hour Day	146.5	19.1	3.1	1.2	0.4	66	29
		Evening	30.6	4.1	0.7	0.2	0.1		
		Night	0.8	0.2	0.0	0.0	0.0		

TABLE A-5 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

CONTROLLED GROWTH POLICY TO 16 MILLION PASSENGERS AT NATIONAL (1990)

Site No.	Description	Period	Time (Minutes) Above Indicated dBA Level 65	75	85	90	95	Ldn	NEF
36	Hadley Hospital	24 Hour Day	151.4	23.8	0.0	0.0	0.0	61	25
		Evening	31.5	4.8	0.0	0.0	0.0		
		Night	0.6	0.0	0.0	0.0	0.0		
37	St. Thomas More School	24 Hour Day	87.9	0.9	0.0	0.0	0.0	54	19
		Evening	18.2	0.2	0.0	0.0	0.0		
		Night	0.2	0.0	0.0	0.0	0.0		
38	Gray High School	24 Hour Day	151.9	41.0	0.0	0.0	0.0	65	28
		Evening	31.4	8.4	0.0	0.0	0.0		
		Night	0.4	0.0	0.0	0.0	0.0		
39	St. Joseph's School	24 Hour Day	187.1	56.2	0.3	0.0	0.0	65	28
		Evening	39.0	11.6	0.1	0.0	0.0		
		Night	0.6	0.2	0.0	0.0	0.0		
40	Waterfowl Sanctuary	24 Hour Day	392.3	103.8	34.5	17.2	5.8	77	39
		Evening	82.9	21.7	7.1	3.5	1.2		
		Night	1.5	0.4	0.1	0.0	0.0		
41	Gravelly Point Park	24 Hour Day	468.1	182.7	31.3	11.7	6.4	79	42
		Evening	99.2	38.5	6.6	2.4	1.3		
		Night	1.7	0.5	0.1	0.0	0.0		
42	Potomac River	24 Hour Day Evening Night	N/A	N/A	N/A	N/A	N/A	74	29

TABLE A-5 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES
RESULTING FROM AIRCRAFT OPERATIONS

CONTROLLED GROWTH POLICY TO 16 MILLION PASSENGERS AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
43	Marina	24 Hour Day	N/A	N/A	N/A	N/A	N/A	72	37
		Evening							
		Night							
44	Daingerfield Island	24 Hour Day	312.8	99.6	22.4	13.0	4.6	76	38
		Evening	65.3	20.7	4.6	2.7	0.9		
		Night	1.3	0.4	0.0	0.0	0.0		
45	East Potomac Park	24 Hour Day	229.6	33.0	5.8	2.8	0.9	72	34
		Evening	48.2	7.0	1.2	0.6	0.2		
		Night	1.3	0.2	0.1	0.0	0.0		
46	Jones Point Park	24 Hour Day	277.5	83.7	11.3	0.0	0.0	69	32
		Evening	57.9	17.3	2.3	0.0	0.0		
		Night	1.3	0.3	0.0	0.0	0.0		
47	West Potomac Park	24 Hour Day	325.4	128.1	20.7	6.7	1.2	74	37
		Evening	68.9	27.2	4.3	1.4	0.2		
		Night	1.1	0.4	0.0	0.0	0.0		
48	Potomac View Park	24 Hour Day	393.3	113.2	15.8	0.0	0.0	70	33
		Evening	82.6	23.5	3.2	0.0	0.0		
		Night	1.3	0.4	0.0	0.0	0.0		
49	The Mall	24 Hour Day	140.2	29.0	0.0	0.0	0.0	63	26
		Evening	29.1	5.9	0.0	0.0	0.0		
		Night	0.5	0.0	0.0	0.0	0.0		

TABLE A-5 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

CONTROLLED GROWTH POLICY TO 16 MILLION PASSENGERS AT NATIONAL (1990)

Site No.	Description	Period	Time (Minutes) Above Indicated dBA Level					Ldn	NEF
			65	75	85	90	95		
50	Rock Creek and Potomac Parkway	24 Hour Day	203.7	42.5	0.8	0.0	0.0	64	27
		Evening	42.5	8.7	0.2	0.0	0.0		
		Night	0.9	0.0	0.0	0.0	0.0		
51	C&O Canal	24 Hour Day	219.1	50.1	3.1	0.0	0.0	64	28
		Evening	45.8	10.4	0.6	0.0	0.0		
		Night	1.0	0.0	0.0	0.0	0.0		
52	Archibold Parkway	24 Hour Day	265.5	78.9	12.7	0.0	0.0	68	31
		Evening	55.9	16.4	2.6	0.0	0.0		
		Night	1.2	0.3	0.0	0.0	0.0		
53	Potomac Palisades Parkway	24 Hour Day	206.5	57.8	9.6	0.0	0.0	67	30
		Evening	43.4	12.0	1.9	0.0	0.0		
		Night	0.9	0.1	0.0	0.0	0.0		
54	George Washington Memorial Parkway	24 Hour Day	281.7	88.7	14.6	0.0	0.0	69	32
		Evening	59.4	18.6	3.0	0.0	0.0		
		Night	1.2	0.3	0.0	0.0	0.0		
55	Arlington House	24 Hour Day	169.5	54.2	4.6	0.0	0.0	67	29
		Evening	35.4	11.2	0.9	0.0	0.0		
		Night	0.6	0.1	0.0	0.0	0.0		
56	Iwo Jima Memorial	24 Hour Day	233.0	85.3	15.3	4.5	0.1	73	35
		Evening	49.0	17.8	3.2	0.9	0.0		
		Night	0.7	0.2	0.0	0.0	0.0		

TABLE A-5 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

CONTROLLED GROWTH POLICY TO 16 MILLION PASSENGERS AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
57	Lady Bird Johnson Park	24 Hour Day	295.2	78.7	25.8	11.6	2.9	75	37
		Evening	62.2	16.4	5.3	2.4	0.6		
		Night	1.2	0.3	0.0	0.0	0.0		
58	Northern Virginia Regional Park	24 Hour Day	159.6	43.4	0.0	0.0	0.0	64	27
		Evening	33.4	8.9	0.0	0.0	0.0		
		Night	0.6	0.0	0.0	0.0	0.0		
	Cabin John	24 Hour Day	90.8	17.8	0.0	0.0	0.0	58	22
		Evening	18.7	3.6	0.0	0.0	0.0		
		Night	0.0	0.0	0.0	0.0	0.0		

N/A - Not Available.

TABLE A-6

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

REDUCED ACTIVITY POLICY AT NATIONAL

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
1	Gadsby's Tavern	24 Hour Day	301.2	75.8	5.2	1.0	0.0	67	30
		Evening	62.8	15.7	1.1	0.2	0.0		
		Night	2.8	0.6	0.0	0.0	0.0		
2	Lloyd House	24 Hour Day	111.5	24.2	0.0	0.0	0.0	61	24
		Evening	23.5	5.0	0.0	0.0	0.0		
		Night	0.6	0.2	0.0	0.0	0.0		
3	Tidal Basin	24 Hour Day	89.8	17.2	0.0	0.0	0.0	62	24
		Evening	18.8	3.6	0.0	0.0	0.0		
		Night	0.5	0.1	0.0	0.0	0.0		
4	The Lyceum	24 Hour Day	111.5	24.2	0.0	0.0	0.0	61	24
		Evening	23.5	5.0	0.0	0.0	0.0		
		Night	0.6	0.2	0.0	0.0	0.0		
5	Jones Point Lighthouse	24 Hour Day	190.6	44.0	3.6	0.0	0.0	65	28
		Evening	39.9	9.2	0.8	0.0	0.0		
		Night	1.6	0.2	0.0	0.0	0.0		
6	Arlington Memorial Bridge	24 Hour Day	242.7	99.0	5.3	1.1	0.0	68	32
		Evening	50.9	20.8	1.1	0.2	0.0		
		Night	2.2	0.9	0.0	0.0	0.0		
7	Theodore Roosevelt	24 Hour Day	243.5	63.7	4.7	0.6	0.0	66	30
		Evening	51.1	13.3	1.0	0.1	0.0		
		24 Hour Day	2.1	0.5	0.0	0.0	0.0		

TABLE A-6 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

REDUCED ACTIVITY POLICY AT NATIONAL

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
8	Georgetown Historic District	24 Hour Day	96.5	12.5	0.0	0.0	0.0	58	21
		Evening	20.2	2.6	0.0	0.0	0.0		
		Night	0.6	0.0	0.0	0.0	0.0		
9	Glover Archibold Parkway	24 Hour Day	157.2	23.7	0.8	0.0	0.0	62	25
		Evening	33.0	4.9	0.2	0.0	0.0		
		Night	1.2	0.1	0.0	0.0	0.0		
10	Arlington National Cemetery	24 Hour Day	93.5	14.7	0.5	0.0	0.0	60	23
		Evening	19.5	3.1	0.1	0.0	0.0		
		Night	0.6	0.1	0.0	0.0	0.0		
11	Arlington House - Robert E. Lee Memorial	24 Hour Day	105.0	25.0	1.4	0.0	0.0	62	25
		Evening	21.9	5.2	0.3	0.0	0.0		
		Night	0.6	0.1	0.0	0.0	0.0		
12	Ft. Myer Historic District	24 Hour Day	80.4	10.6	0.0	0.0	0.0	57	21
		Evening	16.8	2.2	0.0	0.0	0.0		
		Night	0.6	0.0	0.0	0.0	0.0		
13	Doubleday Mansion	24 Hour Day	124.3	29.4	2.7	0.0	0.0	63	26
		Evening	26.1	6.1	0.6	0.0	0.0		
		Night	0.7	0.2	0.0	0.0	0.0		
14	The Glebe	24 Hour Day	57.0	3.5	0.0	0.0	0.0	52	17
		Evening	11.9	0.8	0.0	0.0	0.0		
		Night	0.5	0.0	0.0	0.0	0.0		

TABLE A-6 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

REDUCED ACTIVITY POLICY AT NATIONAL

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
15	C. R. Drew House	24 Hour Day	44.4	0.7	0.0	0.0	0.0	53	17
		Evening	9.2	0.1	0.0	0.0	0.0		
		Night	0.2	0.0	0.0	0.0	0.0		
16	Alexandria Historic District	24 Hour Day	109.5	26.9	0.1	0.0	0.0	62	25
		Evening	23.0	5.6	0.0	0.0	0.0		
		Night	0.6	0.2	0.0	0.0	0.0		
17	Bank of Alexandria	24 Hour Day	301.2	75.8	5.2	1.0	0.0	67	30
		Evening	62.8	15.7	1.1	0.2	0.0		
		Night	2.8	0.6	0.0	0.0	0.0		
18	Carlyle House	24 Hour Day	301.2	75.8	5.2	1.0	0.0	67	30
		Evening	62.8	15.7	1.1	0.2	0.0		
		Night	2.8	0.6	0.0	0.0	0.0		
19	Christ Church	24 Hour Day	111.5	24.2	0.0	0.0	0.0	61	24
		Evening	23.5	5.0	0.0	0.0	0.0		
		Night	0.6	0.2	0.0	0.0	0.0		
20	Potomac Gorge and C&O Canal	24 Hour Day	139.8	28.6	3.1	0.0	0.0	63	26
		Evening	29.4	5.9	0.7	0.0	0.0		
		Night	1.0	0.1	0.0	0.0	0.0		
21	St. Mary's Church	24 Hour Day	112.6	21.0	0.0	0.0	0.0	61	24
		Evening	23.7	4.4	0.0	0.0	0.0		
		Night	0.6	0.1	0.0	0.0	0.0		

TABLE A-6 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

REDUCED ACTIVITY POLICY AT NATIONAL

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
22	Fort Foote Park	24 Hour Day	96.3	12.6	0.0	0.0	0.0	60	23
		Evening	20.2	2.6	0.0	0.0	0.0		
		Night	0.6	0.0	0.0	0.0	0.0		
23	Fort Foote Baptist Church	24 Hour Day	60.5	5.5	0.0	0.0	0.0	55	18
		Evening	12.7	1.2	0.0	0.0	0.0		
		Night	0.3	0.0	0.0	0.0	0.0		
24	Indian Queen School	24 Hour Day	55.0	7.8	0.0	0.0	0.0	57	20
		Evening	11.5	1.6	0.0	0.0	0.0		
		Night	0.3	0.0	0.0	0.0	0.0		
25	Brookmont School	24 Hour Day	84.5	10.8	0.0	0.0	0.0	57	21
		Evening	17.7	2.2	0.0	0.0	0.0		
		Night	0.6	0.0	0.0	0.0	0.0		
26	Sibley Hospital	24 Hour Day	95.6	12.5	0.0	0.0	0.0	59	22
		Evening	20.1	2.5	0.0	0.0	0.0		
		Night	0.7	0.0	0.0	0.0	0.0		
27	American University	24 Hour Day	47.7	2.8	0.0	0.0	0.0	52	17
		Evening	9.9	0.6	0.0	0.0	0.0		
		Night	0.2	0.0	0.0	0.0	0.0		
28	St. John's Child Dev. Center	24 Hour Day	114.2	15.5	0.7	0.0	0.0	61	24
		Evening	24.0	3.1	0.1	0.0	0.0		
		Night	0.8	0.0	0.0	0.0	0.0		

TABLE A-6 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

REDUCED ACTIVITY POLICY AT NATIONAL

			Time (Minutes) Above Indicated dBA Level						
Site No.	**Description**	**Period**	**65**	**75**	**85**	**90**	**95**	**Ldn**	**NEF**
29	Georgetown University	24 Hour Day	133.8	18.0	0.0	0.0	0.0	60	24
		Evening	28.1	3.7	0.0	0.0	0.0		
		Night	0.9	0.0	0.0	0.0	0.0		
30	Woodmont School	24 Hour Day	92.8	13.9	0.0	0.0	0.0	59	22
		Evening	19.4	2.8	0.0	0.0	0.0		
		Night	0.6	0.0	0.0	0.0	0.0		
31	Columbia Hospital	24 Hour Day	62.3	2.7	0.0	0.0	0.0	52	17
		Evening	13.0	0.6	0.0	0.0	0.0		
		Night	0.5	0.0	0.0	0.0	0.0		
32	Lincoln Memorial	24 Hour Day	172.8	33.2	1.9	0.0	0.0	65	28
		Evening	36.0	6.9	0.4	0.0	0.0		
		Night	1.4	0.2	0.0	0.0	0.0		
33	Jefferson Memorial	24 Hour Day	148.1	32.0	2.8	0.1	0.0	64	27
		Evening	31.0	6.6	0.6	0.0	0.0		
		Night	1.3	0.2	0.0	0.0	0.0		
34	St. Mary's School	24 Hour Day	117.8	18.1	0.0	0.0	0.0	61	24
		Evening	24.8	3.7	0.0	0.0	0.0		
		Night	0.7	0.1	0.0	0.0	0.0		
35	Syphax School	24 Hour Day	80.7	13.4	2.2	0.4	0.1	63	25
		Evening	17.3	2.9	0.5	0.1	0.0		
		Night	0.8	0.2	0.0	0.0	0.0		

TABLE A-6 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

REDUCED ACTIVITY POLICY AT NATIONAL

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
36	Hadley Hospital	24 Hour Day	76.7	7.5	0.0	0.0	0.0	57	20
		Evening	16.2	1.6	0.0	0.0	0.0		
		Night	0.6	0.0	0.0	0.0	0.0		
37	St. Thomas More School	24 Hour Day	34.7	0.3	0.0	0.0	0.0	50	15
		Evening	7.2	0.1	0.0	0.0	0.0		
		Night	0.2	0.0	0.0	0.0	0.0		
38	Gray High School	24 Hour Day	81.7	13.9	0.0	0.0	0.0	60	23
		Evening	17.1	2.8	0.0	0.0	0.0		
		Night	0.4	0.0	0.0	0.0	0.0		
39	St. Joseph's School	24 Hour Day	109.5	26.9	0.1	0.0	0.0	62	25
		Evening	23.0	5.6	0.0	0.0	0.0		
		Night	0.6	0.2	0.0	0.0	0.0		
40	Waterfowl Sanctuary	24 Hour Day	306.8	61.9	16.2	6.2	1.9	73	35
		Evening	64.2	12.9	3.3	1.3	0.4		
		Night	2.8	0.4	0.1	0.0	0.0		
41	Gravelly Point Park	24 Hour Day	403.8	148.8	21.3	6.3	2.5	75	38
		Evening	84.2	30.9	4.5	1.3	0.5		
		Night	4.2	1.5	0.2	0.0	0.0		
42	Potomac River	24 Hour Day	N/A	N/A	N/A	N/A	N/A	71	26
		Evening							
		Night							

TABLE A-6 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES
RESULTING FROM AIRCRAFT OPERATIONS

REDUCED ACTIVITY POLICY AT NATIONAL

Site No.	Description	Period	Time (Minutes) Above Indicated dBA Level					Ldn	NEF
			65	75	85	90	95		
43	Marina	24 Hour Day	N/A	N/A	N/A	N/A	N/A	69	34
		Evening							
		Night							
44	Daingerfield Island	24 Hour Day	234.8	70.0	11.1	4.1	1.5	71	34
		Evening	48.9	14.6	2.3	0.8	0.3		
		Night	2.2	0.5	0.0	0.0	0.0		
45	East Potomac Park	24 Hour Day	133.5	20.3	4.8	2.1	0.4	68	31
		Evening	28.3	4.3	1.0	0.5	0.1		
		Night	1.3	0.2	0.1	0.0	0.0		
46	Jones Point Park	24 Hour Day	190.6	44.0	3.6	0.0	0.0	65	28
		Evening	39.9	9.2	0.8	0.0	0.0		
		Night	1.6	0.2	0.0	0.0	0.0		
47	West Potomac Park	24 Hour Day	260.2	96.1	10.4	2.2	0.4	70	33
		Evening	54.4	20.2	2.2	0.4	0.1		
		Night	2.5	0.9	0.0	0.0	0.0		
48	Potomac View Park	24 Hour Day	314.7	77.8	5.0	0.0	0.0	66	29
		Evening	65.7	16.1	1.0	0.0	0.0		
		Night	2.9	0.6	0.0	0.0	0.0		
49	The Mall	24 Hour Day	71.8	9.2	0.0	0.0	0.0	58	21
		Evening	14.9	1.9	0.0	0.0	0.0		
		Night	0.5	0.0	0.0	0.0	0.0		

TABLE A-6 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

REDUCED ACTIVITY POLICY AT NATIONAL

Site No.	Description	Period	Time (Minutes) Above Indicated dBA Level 65	75	85	90	95	Ldn	NEF
50	Rock Creek and Potomac Parkway	24 Hour Day	118.7	15.5	0.3	0.0	0.0	60	23
		Evening	24.9	3.2	0.1	0.0	0.0		
		Night	0.7	0.0	0.0	0.0	0.0		
51	C&O Canal	24 Hour Day	134.8	18.3	1.0	0.0	0.0	61	24
		Evening	28.2	3.8	0.2	0.0	0.0		
		Night	0.9	0.0	0.0	0.0	0.0		
52	Archibold Parkway	24 Hour Day	190.2	41.2	4.1	0.0	0.0	64	28
		Evening	39.9	8.6	0.9	0.0	0.0		
		Night	1.5	0.2	0.0	0.0	0.0		
53	Potomac Palisades Parkway	24 Hour Day	139.8	28.6	3.1	0.0	0.0	63	26
		Evening	29.4	5.9	0.7	0.0	0.0		
		Night	1.0	0.1	0.0	0.0	0.0		
54	George Washington Memorial Parkway	24 Hour Day	208.0	53.7	4.7	0.0	0.0	65	28
		Evening	43.7	11.3	1.0	0.0	0.0		
		Night	1.7	0.4	0.0	0.0	0.0		
55	Arlington House	24 Hour Day	105.0	25.0	1.4	0.0	0.0	62	25
		Evening	21.9	5.2	0.3	0.0	0.0		
		Night	0.6	0.1	0.0	0.0	0.0		
56	Iwo Jima Memorial	24 Hour Day	167.5	54.3	7.2	1.4	0.0	69	31
		Evening	35.0	11.3	1.5	0.3	0.0		
		Night	1.2	0.4	0.0	0.0	0.0		

TABLE A-6 (CONT)

WASHINGTON NATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

REDUCED ACTIVITY POLICY AT NATIONAL

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
57	Lady Bird Johnson Park	24 Hour Day	207.3	48.3	11.1	3.7	0.9	70	33
		Evening	43.6	10.1	2.3	0.8	0.2		
		Night	1.7	0.3	0.0	0.0	0.0		
58	Northern Virginia Regional Park	24 Hour Day	100.3	13.9	0.0	0.0	0.0	60	23
		Evening	21.0	2.8	0.0	0.0	0.0		
		Night	0.6	0.0	0.0	0.0	0.0		
	Cabin John	24 Hour Day	37.7	5.7	0.0	0.0	0.0	54	18
		Evening	7.8	1.2	0.0	0.0	0.0		
		Night	0.0	0.0	0.0	0.0	0.0		

N/A - Not Available.

TABLE A-7

DULLES INTERNATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

EXISTING CONDITIONS (1976)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	85	90	95	100	105	Ldn	NEF
1	Sully Plantation	24 Hour Day	6.0	2.0	1.0	1.0	0.0	69	35
		Evening	1.3	0.6	0.3	0.1	0.0		
		Night	0.5	0.1	0.0	0.0	0.0		
2	Frying Pan Church	24 Hour Day	2.0	1.0	1.0	1.0	0.0	55	20
		Evening	0.5	0.4	0.4	0.2	0.1		
		Night	0.0	0.0	0.0	0.0	0.0		
3	The Mitchell House	24 Hour Day	4.0	2.0	1.0	0.0	0.0	67	33
		Evening	1.0	0.4	0.2	0.1	0.0		
		Night	0.3	0.0	0.0	0.0	0.0		
4	The Hermitage	24 Hour Day	2.0	1.0	1.0	0.0	0.0	64	29
		Evening	0.5	0.3	0.1	0.1	0.0		
		Night	0.0	0.0	0.0	0.0	0.0		
5	Leeton	24 Hour Day	2.0	1.0	0.0	0.0	0.0	64	31
		Evening	0.5	0.3	0.0	0.0	0.0		
		Night	0.0	0.0	0.0	0.0	0.0		
6	Walney, Cabell's Mill & Millers House	24 Hour Day	1.0	0.0	0.0	0.0	0.0	64	31
		Evening	0.4	0.1	0.0	0.0	0.0		
		Night	0.0	0.0	0.0	0.0	0.0		
7	Oak Hill	24 Hour Day	2.0	0.0	0.0	0.0	0.0	44	9
		Evening	0.4	0.1	0.0	0.0	0.0		
		24 Hour Day	0.0	0.0	0.0	0.0	0.0		

TABLE A-7 (CONT)

DULLES INTERNATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

EXISTING CONDITIONS (1976)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	85	90	95	100	105	Ldn	NEF
8	Broadrun Bridge & Toll House	24 Hour Day	3.0	1.0	0.0	0.0	0.0	60	26
		Evening	0.9	0.3	0.1	0.0	0.0		
		Night	0.0	0.0	0.0	0.0	0.0		
9	Belmont	24 Hour Day	4.0	2.0	0.0	0.0	0.0	58	25
		Evening	1.2	0.6	0.0	0.0	0.0		
		Night	0.0	0.0	0.0	0.0	0.0		
10	E. C. Lawrence Park	24 Hour Day	1.0	0.0	0.0	0.0	0.0	64	31
		Evening	0.4	0.1	0.0	0.0	0.0		
		Night	0.0	0.0	0.0	0.0	0.0		
11	Chalet Woods Park	24 Hour Day	1.0	0.0	0.0	0.0	0.0	61	27
		Evening	0.2	0.0	0.0	0.0	0.0		
		Night	0.0	0.0	0.0	0.0	0.0		
12	Manassas National Battlefield Park	24 Hour Day	1.0	0.0	0.0	0.0	0.0	52	18
		Evening	0.1	0.0	0.0	0.0	0.0		
		Night	0.0	0.0	0.0	0.0	0.0		
13	Frog Branch Park	24 Hour Day	2.0	1.0	0.0	0.0	0.0	57	23
		Evening	0.5	0.4	0.1	0.0	0.0		
		Night	0.0	0.0	0.0	0.0	0.0		
14	Frying Pan Park	24 Hour Day	2.0	1.0	1.0	1.0	0.0	55	20
		Evening	0.5	0.4	0.4	0.2	0.1		
		24 Hour Day	0.0	0.0	0.0	0.0	0.0		

TABLE A-7 (CONT)

DULLES INTERNATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES
RESULTING FROM AIRCRAFT OPERATIONS

EXISTING CONDITIONS (1976)

			Time (Minutes) Above Indicated dBA Level[1]						
Site No.	Description	Period	85	90	95	100	105	Ldn	NEF
15	Bruin Park	24 Hour Day	2.0	1.0	1.0	0.0	0.0	51	16
		Evening	0.4	0.4	0.3	0.0	0.0		
		Night	0.0	0.0	0.0	0.0	0.0		
16	Northern Virginia Community College	24 Hour Day	2.0	1.0	0.0	0.0	0.0	49	13
		Evening	0.5	0.3	0.0	0.0	0.0		
		Night	0.0	0.0	0.0	0.0	0.0		
17	Cedar Lane Church	24 Hour Day	4.0	3.0	1.0	0.0	0.0	55	20
		Evening	1.1	0.7	0.2	0.0	0.0		
		Night	0.0	0.0	0.0	0.0	0.0		
18	Arcola	24 Hour Day	3.0	2.0	0.0	0.0	0.0	60	26
		Evening	0.7	0.6	0.1	0.0	0.0		
		Night	0.0	0.0	0.0	0.0	0.0		
19	Oak Grove School	24 Hour Day	2.0	1.0	1.0	0.0	0.0	53	19
		Evening	0.7	0.4	0.4	0.1	0.0		
		Night	0.0	0.0	0.0	0.0	0.0		
20	Centreville	24 Hour Day	1.0	0.0	0.0	0.0	0.0	61	28
		Evening	0.3	0.0	0.0	0.0	0.0		
		Night	0.0	0.0	0.0	0.0	0.0		
21	Sterling	24 Hour Day	2.0	2.0	1.0	0.0	0.0	65	33
		Evening	0.6	0.5	0.2	0.0	0.0		
		24 Hour Day	0.0	0.0	0.0	0.0	0.0		

[1] Time (minutes) above does not include the assumed four Concorde operations per day. However, Ldn and NEF values include Condorde operations.

TABLE A-8

DULLES INTERNATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

NO POLICY CHANGE (1990)

Site No.	Description	Period	Time (Minutes) Above Indicated dBA Level 65	75	85	95	100	Ldn	NEF
1	Sully Plantation	24 Hour Day	142.1	41.9	5.9	0.0	0.0	71	35
		Evening	27.6	8.1	1.1	0.0	0.0		
		Night	12.0	3.8	0.6	0.0	0.0		
2	Frying Pan Church	24 Hour Day	105.9	2.9	0.0	0.0	0.0	57	21
		Evening	20.6	0.6	0.0	0.0	0.0		
		Night	7.8	0.2	0.0	0.0	0.0		
3	The Mitchell House	24 Hour Day	147.1	39.0	4.0	0.0	0.0	67	32
		Evening	28.6	7.5	0.8	0.0	0.0		
		Night	12.5	3.6	0.4	0.0	0.0		
4	The Hermitage	24 Hour Day	107.2	17.2	0.0	0.0	0.0	68	31
		Evening	20.7	3.2	0.0	0.0	0.0		
		Night	9.7	1.8	0.0	0.0	0.0		
5	Leeton	24 Hour Day	133.2	19.1	0.0	0.0	0.0	64	29
		Evening	25.7	3.6	0.0	0.0	0.0		
		Night	11.6	2.0	0.0	0.0	0.0		
6	Walney, Cabell's Mill & Millers House	24 Hour Day	129.2	19.2	0.1	0.0	0.0	64	29
		Evening	25.0	3.6	0.0	0.0	0.0		
		Night	11.6	2.0	0.0	0.0	0.0		
7	Oak Hill	24 Hour Day	0.0	0.0	0.0	0.0	0.0	45	9
		Evening	0.0	0.0	0.0	0.0	0.0		
		24 Hour Day	0.0	0.0	0.0	0.0	0.0		

TABLE A-8 (CONT)

DULLES INTERNATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

NO POLICY CHANGE (1990)

Site No.	Description	Period	Time (Minutes) Above Indicated dBA Level					Ldn	NEF
			65	75	85	95	100		
8	Broadrun Bridge & Toll House	24 Hour Day	81.8	1.1	0.0	0.0	0.0	59	24
		Evening	15.9	0.2	0.0	0.0	0.0		
		Night	6.1	0.1	0.0	0.0	0.0		
9	Belmont	24 Hour Day	22.7	7.2	0.0	0.0	0.0	60	24
		Evening	4.3	1.3	0.0	0.0	0.0		
		Night	2.5	0.8	0.0	0.0	0.0		
10	E. C. Lawrence Park	24 Hour Day	129.2	19.2	0.1	0.0	0.0	64	29
		Evening	25.0	3.6	0.0	0.0	0.0		
		Night	11.6	2.0	0.0	0.0	0.0		
11	Chalet Woods Park	24 Hour Day	91.5	11.4	0.0	0.0	0.0	60	25
		Evening	17.6	2.2	0.0	0.0	0.0		
		Night	8.4	1.2	0.0	0.0	0.0		
12	Manassas National Battlefield Park	24 Hour Day	30.1	0.0	0.0	0.0	0.0	53	19
		Evening	5.7	0.0	0.0	0.0	0.0		
		Night	3.2	0.0	0.0	0.0	0.0		
13	Frog Branch Park	24 Hour Day	89.4	8.4	0.0	0.0	0.0	58	23
		Evening	17.2	1.6	0.0	0.0	0.0		
		Night	7.7	0.8	0.0	0.0	0.0		
14	Frying Pan Park	24 Hour Day	105.9	2.9	0.0	0.0	0.0	57	21
		Evening	20.6	0.6	0.0	0.0	0.0		
		24 Hour Day	7.8	0.2	0.0	0.0	0.0		

TABLE A-8 (CONT)

DULLES INTERNATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

NO POLICY CHANGE (1990)

Site No.	Description	Period	Time (Minutes) Above Indicated dBA Level[1]					Ldn	NEF
			65	75	85	95	100		
15	Bruin Park	24 Hour Day	0.4	0.0	0.0	0.0	0.0	54	18
		Evening	0.1	0.0	0.0	0.0	0.0		
		Night	0.0	0.0	0.0	0.0	0.0		
16	Northern Virginia Community College	24 Hour Day	5.3	0.0	0.0	0.0	0.0	52	16
		Evening	1.0	0.0	0.0	0.0	0.0		
		Night	0.5	0.0	0.0	0.0	0.0		
17	Cedar Lane Church	24 Hour Day	22.3	2.5	0.0	0.0	0.0	57	21
		Evening	4.2	0.5	0.0	0.0	0.0		
		Night	2.4	0.2	0.0	0.0	0.0		
18	Arcola	24 Hour Day	41.7	10.5	0.0	0.0	0.0	61	26
		Evening	8.0	2.0	0.0	0.0	0.0		
		Night	4.5	1.1	0.0	0.0	0.0		
19	Oak Grove School	24 Hour Day	59.5	0.0	0.0	0.0	0.0	55	20
		Evening	11.6	0.0	0.0	0.0	0.0		
		Night	4.2	0.0	0.0	0.0	0.0		
20	Centreville	24 Hour Day	84.9	12.5	0.0	0.0	0.0	62	26
		Evening	16.4	2.4	0.0	0.0	0.0		
		Night	7.6	1.3	0.0	0.0	0.0		
21	Sterling	24 Hour Day	118.7	24.6	0.3	0.0	0.0	63	28
		Evening	23.1	4.8	0.1	0.0	0.0		
		24 Hour Day	8.2	1.8	0.0	0.0	0.0		

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[1] Time (minutes) above does not include the assumed four Concorde operations per day. However, Ldn and NEF values include Concorde operations.

TABLE A-9

DULLES INTERNATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

EXPANDED GROWTH POLICY AT WASHINGTON NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	95	100	Ldn	NEF
1	Sully Plantation	24 Hour Day	143.1	42.3	6.6	0.0	0.0	71	35
		Evening	28.6	8.4	1.3	0.0	0.0		
		Night	12.1	3.9	0.8	0.0	0.0		
2	Frying Pan Church	24 Hour Day	109.9	3.2	0.0	0.0	0.0	57	21
		Evening	21.7	0.6	0.0	0.0	0.0		
		Night	8.6	0.4	0.0	0.0	0.0		
3	The Mitchell House	24 Hour Day	148.4	39.6	4.5	0.0	0.0	68	32
		Evening	29.5	7.9	0.9	0.0	0.0		
		Night	12.7	3.7	0.5	0.0	0.0		
4	The Hermitage	24 Hour Day	109.0	19.1	0.0	0.0	0.0	68	32
		Evening	21.7	3.8	0.0	0.0	0.0		
		Night	10.0	2.2	0.0	0.0	0.0		
5	Leeton	24 Hour Day	135.6	20.8	0.0	0.0	0.0	65	29
		Evening	27.1	4.1	0.0	0.0	0.0		
		Night	12.0	2.3	0.0	0.0	0.0		
6	Walney, Cabell's Mill & Millers House	24 Hour Day	131.1	21.1	0.1	0.0	0.0	65	29
		Evening	26.3	4.2	0.0	0.0	0.0		
		Night	11.8	2.4	0.0	0.0	0.0		
7	Oak Hill	24 Hour Day	0.0	0.0	0.0	0.0	0.0	45	10
		Evening	0.0	0.0	0.0	0.0	0.0		
		24 Hour Day	0.0	0.0	0.0	0.0	0.0		

TABLE A-9 (CONT)

DULLES INTERNATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

EXPANDED GROWTH POLICY AT WASHINGTON NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	95	100	Ldn	NEF
8	Broadrun Bridge & Toll House	24 Hour Day	83.7	1.2	0.0	0.0	0.0	60	24
		Evening	16.5	0.3	0.0	0.0	0.0		
		Night	6.3	0.1	0.0	0.0	0.0		
9	Belmont	24 Hour Day	23.1	8.0	0.0	0.0	0.0	60	25
		Evening	4.6	1.6	0.0	0.0	0.0		
		Night	2.5	0.9	0.0	0.0	0.0		
10	E. C. Lawrence Park	24 Hour Day	131.1	21.1	0.1	0.0	0.0	65	29
		Evening	26.3	4.2	0.0	0.0	0.0		
		Night	11.8	2.4	0.0	0.0	0.0		
11	Chalet Woods Park	24 Hour Day	92.5	12.8	0.0	0.0	0.0	60	25
		Evening	18.4	2.6	0.0	0.0	0.0		
		Night	8.5	1.4	0.0	0.0	0.0		
12	Manassas National Battlefield Park	24 Hour Day	33.2	0.0	0.0	0.0	0.0	53	19
		Evening	6.6	0.0	0.0	0.0	0.0		
		Night	3.7	0.0	0.0	0.0	0.0		
13	Frog Branch Park	24 Hour Day	92.7	9.8	0.0	0.0	0.0	58	24
		Evening	18.3	1.9	0.0	0.0	0.0		
		Night	8.3	1.1	0.0	0.0	0.0		
14	Frying Pan Park	24 Hour Day	109.9	3.2	0.0	0.0	0.0	57	21
		Evening	21.7	0.6	0.0	0.0	0.0		
		24 Hour Day	8.6	0.4	0.0	0.0	0.0		

TABLE A-9 (CONT)

DULLES INTERNATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

EXPANDED GROWTH POLICY AT WASHINGTON NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level[1]						
Site No.	Description	Period	65	75	85	95	100	Ldn	NEF
15	Bruin Park	24 Hour Day	0.5	0.0	0.0	0.0	0.0	54	19
		Evening	0.1	0.0	0.0	0.0	0.0		
		Night	0.1	0.0	0.0	0.0	0.0		
16	Northern Virginia Community College	24 Hour Day	6.3	0.0	0.0	0.0	0.0	52	16
		Evening	1.2	0.0	0.0	0.0	0.0		
		Night	0.7	0.0	0.0	0.0	0.0		
17	Cedar Lane Church	24 Hour Day	24.8	2.9	0.0	0.0	0.0	57	21
		Evening	4.9	0.6	0.0	0.0	0.0		
		Night	2.8	0.3	0.0	0.0	0.0		
18	Arcola	24 Hour Day	43.0	11.8	0.0	0.0	0.0	61	26
		Evening	8.6	2.3	0.0	0.0	0.0		
		Night	4.7	1.3	0.0	0.0	0.0		
19	Oak Grove School	24 Hour Day	62.3	0.0	0.0	0.0	0.0	56	21
		Evening	12.1	0.0	0.0	0.0	0.0		
		Nignt	4.7	0.0	0.0	0.0	0.0		
20	Centreville	24 Hour Day	85.8	13.8	0.0	0.0	0.0	62	27
		Evening	17.2	2.7	0.0	0.0	0.0		
		Night	7.7	1.6	0.0	0.0	0.0		
21	Sterling	24 Hour Day	120.0	25.2	0.3	0.0	0.0	63	28
		Evening	23.6	5.0	0.1	0.0	0.0		
		24 Hour Day	8.4	1.9	0.0	0.0	0.0		

[1] Time (minutes) above does not include the assumed four Concorde operations per day. However, Ldn and NEF values include Concorde operations.

TABLE A-10

DULLES INTERNATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

CONTROLLED GROWTH POLICY TO 18 MILLION PASSENGERS AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	95	100	Ldn	NEF
1	Sully Plantation	24 Hour Day	164.3	50.0	8.8	0.0	0.0	72	36
		Evening	32.8	9.9	1.7	0.0	0.0		
		Night	14.5	4.8	1.0	0.0	0.0		
2	Frying Pan Church	24 Hour Day	123.0	4.8	0.0	0.0	0.0	58	23
		Evening	24.4	1.0	0.0	0.0	0.0		
		Night	10.0	0.6	0.0	0.0	0.0		
3	The Mitchell House	24 Hour Day	172.1	46.7	6.2	0.0	0.0	69	33
		Evening	34.4	9.3	1.2	0.0	0.0		
		Night	15.5	4.5	0.7	0.0	0.0		
4	The Hermitage	24 Hour Day	129.2	25.2	0.0	0.0	0.0	69	32
		Evening	25.7	5.0	0.0	0.0	0.0		
		Night	12.3	2.8	0.0	0.0	0.0		
5	Leeton	24 Hour Day	158.9	26.9	0.0	0.0	0.0	66	30
		Evening	31.7	5.4	0.0	0.0	0.0		
		Night	14.6	3.0	0.0	0.0	0.0		
6	Walney, Cabell's Mill & Millers House	24 Hour Day	153.6	27.5	0.1	0.0	0.0	65	30
		Evening	30.8	5.5	0.0	0.0	0.0		
		Night	14.2	3.1	0.0	0.0	0.0		
7	Oak Hill	24 Hour Day	0.0	0.0	0.0	0.0	0.0	46	10
		Evening	0.0	0.0	0.0	0.0	0.0		
		24 Hour Day	0.0	0.0	0.0	0.0	0.0		

TABLE A-10 (CONT)

DULLES INTERNATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES
RESULTING FROM AIRCRAFT OPERATIONS

CONTROLLED GROWTH POLICY TO 18 MILLION PASSENGERS AT NATIONAL (1990)

Site No.	Description	Period	Time (Minutes) Above Indicated dBA Level 65	75	85	95	100	Ldn	NEF
8	Broadrun Bridge & Toll House	24 Hour Day	91.2	1.4	0.0	0.0	0.0	60	24
		Evening	18.0	0.3	0.0	0.0	0.0		
		Night	7.1	0.1	0.0	0.0	0.0		
9	Belmont	24 Hour Day	29.6	10.3	0.0	0.0	0.0	61	26
		Evening	5.9	2.0	0.0	0.0	0.0		
		Night	3.3	1.2	0.0	0.0	0.0		
10	E. C. Lawrence Park	24 Hour Day	153.6	27.5	0.1	0.0	0.0	65	30
		Evening	30.8	5.5	0.0	0.0	0.0		
		Night	14.2	3.1	0.0	0.0	0.0		
11	Chalet Woods Park	24 Hour Day	108.9	17.4	0.0	0.0	0.0	61	26
		Evening	21.6	3.5	0.0	0.0	0.0		
		Night	10.4	1.9	0.0	0.0	0.0		
12	Manassas National Battlefield Park	24 Hour Day	43.8	0.0	0.0	0.0	0.0	54	21
		Evening	8.8	0.0	0.0	0.0	0.0		
		Night	4.9	0.0	0.0	0.0	0.0		
13	Frog Branch Park	24 Hour Day	109.5	14.0	0.0	0.0	0.0	59	25
		Evening	21.7	2.8	0.0	0.0	0.0		
		Night	10.2	1.6	0.0	0.0	0.0		
14	Frying Pan Park	24 Hour Day	123.0	4.8	0.0	0.0	0.0	58	23
		Evening	24.4	1.0	0.0	0.0	0.0		
		24 Hour Day	10.0	0.6	0.0	0.0	0.0		

TABLE A-10 (CONT)

DULLES INTERNATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

CONTROLLED GROWTH POLICY TO 18 MILLION PASSENGERS AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level[1]						
Site No.	Description	Period	65	75	85	95	100	Ldn	NEF
15	Bruin Park	24 Hour Day	0.7	0.0	0.0	0.0	0.0	55	20
		Evening	0.1	0.0	0.0	0.0	0.0		
		Night	0.1	0.0	0.0	0.0	0.0		
16	Northern Virginia Community College	24 Hour Day	8.8	0.0	0.0	0.0	0.0	52	17
		Evening	1.7	0.0	0.0	0.0	0.0		
		Night	1.0	0.0	0.0	0.0	0.0		
17	Cedar Lane Church	24 Hour Day	32.2	4.1	0.0	0.0	0.0	58	22
		Evening	6.4	0.8	0.0	0.0	0.0		
		Night	3.5	0.5	0.0	0.0	0.0		
18	Arcola	24 Hour Day	55.3	15.6	0.0	0.0	0.0	62	27
		Evening	11.1	3.1	0.0	0.0	0.0		
		Night	6.1	1.7	0.0	0.0	0.0		
19	Oak Grove School	24 Hour Day	70.0	0.1	0.0	0.0	0.0	56	22
		Evening	13.7	0.0	0.0	0.0	0.0		
		Night	5.7	0.0	0.0	0.0	0.0		
20	Centreville	24 Hour Day	100.1	18.1	0.0	0.0	0.0	63	28
		Evening	20.0	3.6	0.0	0.0	0.0		
		Night	9.3	2.0	0.0	0.0	0.0		
21	Sterling	24 Hour Day	127.0	27.7	0.3	0.0	0.0	64	29
		Evening	25.0	5.5	0.1	0.0	0.0		
		24 Hour Day	9.1	2.2	0.0	0.0	0.0		

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[1] Time (minutes) above does not include the assumed four Concorde operations per day. However, Ldn and NEF values include Concorde operations.

TABLE A-11

DULLES INTERNATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

CONTROLLED GROWTH POLICY TO 16 MILLION PASSENGERS AT NATIONAL (1990)

Site No.	Description	Period	Time (Minutes) Above Indicated dBA Level					Ldn	NEF
			65	75	85	95	100		
1	Sully Plantation	24 Hour Day	173.2	53.0	9.4	0.0	0.0	72	36
		Evening	35.7	11.1	2.0	0.0	0.0		
		Night	14.8	4.8	1.0	0.0	0.0		
2	Frying Pan Church	24 Hour Day	127.0	5.6	0.0	0.0	0.0	58	23
		Evening	25.8	1.1	0.0	0.0	0.0		
		Night	10.0	0.6	0.0	0.0	0.0		
3	The Mitchell House	24 Hour Day	182.3	49.2	6.7	0.0	0.0	69	33
		Evening	37.6	10.4	1.4	0.0	0.0		
		Night	15.7	4.5	0.7	0.0	0.0		
4	The Hermitage	24 Hour Day	137.1	26.8	0.0	0.0	0.0	69	32
		Evening	28.6	5.8	0.0	0.0	0.0		
		Night	12.4	2.8	0.0	0.0	0.0		
5	Leeton	24 Hour Day	167.3	28.5	0.0	0.0	0.0	66	31
		Evening	34.8	6.2	0.0	0.0	0.0		
		Night	14.7	2.9	0.0	0.0	0.0		
6	Walney, Cabell's Mill & Millers House	24 Hour Day	162.3	29.3	0.1	0.0	0.0	66	30
		Evening	33.8	6.4	0.0	0.0	0.0		
		Night	14.4	3.0	0.0	0.0	0.0		
7	Oak Hill	24 Hour Day	0.0	0.0	0.0	0.0	0.0	46	11
		Evening	0.0	0.0	0.0	0.0	0.0		
		24 Hour Day	0.0	0.0	0.0	0.0	0.0		

TABLE A-11 (CONT)

DULLES INTERNATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

CONTROLLED GROWTH POLICY TO 16 MILLION PASSENGERS AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	95	100	Ldn	NEF
8	Broadrun Bridge & Toll House	24 Hour Day	93.5	1.4	0.0	0.0	0.0	60	25
		Evening	19.0	0.3	0.0	0.0	0.0		
		Night	7.1	0.1	0.0	0.0	0.0		
9	Belmont	24 Hour Day	32.2	10.9	0.0	0.0	0.0	61	26
		Evening	6.8	2.3	0.0	0.0	0.0		
		Night	3.5	1.2	0.0	0.0	0.0		
10	E. C. Lawrence Park	24 Hour Day	162.3	29.3	0.1	0.0	0.0	66	30
		Evening	33.8	6.4	0.0	0.0	0.0		
		Night	14.4	3.0	0.0	0.0	0.0		
11	Chalet Woods Park	24 Hour Day	115.5	18.6	0.0	0.0	0.0	61	26
		Evening	24.0	4.0	0.0	0.0	0.0		
		Night	10.6	1.9	0.0	0.0	0.0		
12	Manassas National Battlefield Park	24 Hour Day	46.6	0.0	0.0	0.0	0.0	54	21
		Evening	10.0	0.0	0.0	0.0	0.0		
		Night	4.9	0.0	0.0	0.0	0.0		
13	Frog Branch Park	24 Hour Day	115.4	15.6	0.0	0.0	0.0	59	25
		Evening	23.8	3.3	0.0	0.0	0.0		
		Night	10.4	1.6	0.0	0.0	0.0		
14	Frying Pan Park	24 Hour Day	127.0	5.6	0.0	0.0	0.0	58	23
		Evening	25.8	1.1	0.0	0.0	0.0		
		24 Hour Day	10.0	0.6	0.0	0.0	0.0		

TABLE A-11 (CONT)

DULLES INTERNATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

CONTROLLED GROWTH POLICY TO 16 MILLION PASSENGERS AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level[1]						
Site No.	Description	Period	65	75	85	95	100	Ldn	NEF
15	Bruin Park	24 Hour Day	0.8	0.0	0.0	0.0	0.0	55	20
		Evening	0.2	0.0	0.0	0.0	0.0		
		Night	0.1	0.0	0.0	0.0	0.0		
16	Northern Virginia Community College	24 Hour Day	9.9	0.0	0.0	0.0	0.0	53	17
		Evening	2.1	0.0	0.0	0.0	0.0		
		Night	1.0	0.0	0.0	0.0	0.0		
17	Cedar Lane Church	24 Hour Day	34.2	4.6	0.0	0.0	0.0	58	22
		Evening	7.3	1.0	0.0	0.0	0.0		
		Night	3.5	0.5	0.0	0.0	0.0		
18	Arcola	24 Hour Day	60.0	16.6	0.0	0.0	0.0	62	27
		Evening	12.8	3.6	0.0	0.0	0.0		
		Night	6.3	1.7	0.0	0.0	0.0		
19	Oak Grove School	24 Hour Day	73.1	0.1	0.0	0.0	0.0	57	22
		Evening	14.7	0.0	0.0	0.0	0.0		
		Night	5.7	0.0	0.0	0.0	0.0		
20	Centreville	24 Hour Day	105.2	19.2	0.0	0.0	0.0	63	28
		Evening	22.0	4.1	0.0	0.0	0.0		
		Night	9.3	2.0	0.0	0.0	0.0		
21	Sterling	24 Hour Day	129.6	28.8	0.3	0.0	0.0	64	29
		Evening	26.0	5.8	0.1	0.0	0.0		
		24 Hour Day	9.2	2.2	0.0	0.0	0.0		

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[1] Time (minutes) above does not include the assumed four Concorde operations per day. However, Ldn and NEF values include Concorde operations.

TABLE A-12

DULLES INTERNATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

REDUCED ACTIVITY POLICY AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	95	100	Ldn	NEF
1	Sully Plantation	24 Hour Day	180.1	55.6	10.2	0.0	0.0	73	37
		Evening	36.2	11.2	2.0	0.0	0.0		
		Night	15.9	5.2	1.1	0.0	0.0		
2	Frying Pan Church	24 Hour Day	130.1	6.0	0.0	0.0	0.0	58	23
		Evening	25.6	1.1	0.0	0.0	0.0		
		Night	10.6	0.6	0.0	0.0	0.0		
3	The Mitchell House	24 Hour Day	189.9	51.6	7.4	0.0	0.0	69	34
		Evening	38.1	10.5	1.4	0.0	0.0		
		Night	16.9	4.9	0.8	0.0	0.0		
4	The Hermitage	24 Hour Day	143.4	28.2	0.0	0.0	0.0	69	32
		Evening	28.9	5.6	0.0	0.0	0.0		
		Night	13.5	3.1	0.0	0.0	0.0		
5	Leeton	24 Hour Day	173.9	29.9	0.0	0.0	0.0	66	31
		Evening	35.0	6.1	0.0	0.0	0.0		
		Night	15.9	3.2	0.0	0.0	0.0		
6	Walney, Cabell's Mill & Millers House	24 Hour Day	169.0	31.0	0.1	0.0	0.0	66	31
		Evening	34.2	6.3	0.0	0.0	0.0		
		Night	15.6	3.3	0.0	0.0	0.0		
7	Oak Hill	24 Hour Day	0.0	0.0	0.0	0.0	0.0	46	11
		Evening	0.0	0.0	0.0	0.0	0.0		
		24 Hour Day	0.0	0.0	0.0	0.0	0.0		

TABLE A-12 (CONT)

DULLES INTERNATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

REDUCED ACTIVITY POLICY AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	95	100	Ldn	NEF
8	Broadrun Bridge & Toll House	24 Hour Day	95.4	1.4	0.0	0.0	0.0	60	25
		Evening	18.9	0.3	0.0	0.0	0.0		
		Night	7.5	0.1	0.0	0.0	0.0		
9	Belmont	24 Hour Day	34.8	11.5	0.0	0.0	0.0	62	26
		Evening	7.0	2.3	0.0	0.0	0.0		
		Night	3.8	1.3	0.0	0.0	0.0		
10	E. C. Lawrence Park	24 Hour Day	169.0	31.0	0.1	0.0	0.0	66	31
		Evening	34.2	6.3	0.0	0.0	0.0		
		Night	15.6	3.3	0.0	0.0	0.0		
11	Chalet Woods Park	24 Hour Day	121.2	19.7	0.0	0.0	0.0	62	27
		Evening	24.4	3.9	0.0	0.0	0.0		
		Night	11.6	2.1	0.0	0.0	0.0		
12	Manassas National Battlefield Park	24 Hour Day	49.5	0.0	0.0	0.0	0.0	55	21
		Evening	9.9	0.0	0.0	0.0	0.0		
		Night	5.4	0.0	0.0	0.0	0.0		
13	Frog Branch Park	24 Hour Day	119.8	17.2	0.0	0.0	0.0	60	26
		Evening	23.8	3.3	0.0	0.0	0.0		
		Night	11.1	1.9	0.0	0.0	0.0		
14	Frying Pan Park	24 Hour Day	130.1	6.0	0.0	0.0	0.0	58	23
		Evening	25.6	1.1	0.0	0.0	0.0		
		24 Hour Day	10.6	0.6	0.0	0.0	0.0		

TABLE A-12 (CONT)

DULLES INTERNATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

REDUCED ACTIVITY POLICY AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level[1]						
Site No.	Description	Period	65	75	85	95	100	Ldn	NEF
15	Bruin Park	24 Hour Day	0.9	0.0	0.0	0.0	0.0	55	20
		Evening	0.2	0.0	0.0	0.0	0.0		
		Night	0.1	0.0	0.0	0.0	0.0		
16	Northern Virginia Community College	24 Hour Day	10.8	0.0	0.0	0.0	0.0	52	17
		Evening	2.1	0.0	0.0	0.0	0.0		
		Night	1.2	0.0	0.0	0.0	0.0		
17	Cedar Lane Church	24 Hour Day	35.9	5.1	0.0	0.0	0.0	58	23
		Evening	7.2	1.0	0.0	0.0	0.0		
		Night	3.9	0.6	0.0	0.0	0.0		
18	Arcola	24 Hour Day	63.9	17.5	0.0	0.0	0.0	63	28
		Evening	13.0	3.5	0.0	0.0	0.0		
		Night	7.0	1.9	0.0	0.0	0.0		
19	Oak Grove School	24 Hour Day	76.0	0.1	0.0	0.0	0.0	57	22
		Evening	14.7	0.0	0.0	0.0	0.0		
		Night	6.2	0.0	0.0	0.0	0.0		
20	Centreville	24 Hour Day	109.1	20.4	0.0	0.0	0.0	63	29
		Evening	22.1	4.1	0.0	0.0	0.0		
		Night	10.1	2.2	0.0	0.0	0.0		
21	Sterling	24 Hour Day	131.4	29.6	0.4	0.0	0.0	64	29
		Evening	26.0	5.8	0.1	0.0	0.0		
		24 Hour Day	9.5	2.3	0.0	0.0	0.0		

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[1] Time (minutes) above does not include the assumed four Concorde operations per day. However, Ldn and NEF values include Concorde operations.

TABLE A-13

BALTIMORE-WASHINGTON INTERNATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

EXISTING CONDITIONS (1976)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
1	Waterloo School	24 Hour Day	58.0	3.0	0.0	0.0	0.0	60	26
		Evening	10.4	0.5	0.0	0.0	0.0		
		Night	6.0	0.4	0.0	0.0	0.0		
2	St. Mark's School	24 Hour Day	163.0	59.0	14.0	5.0	2.0	78	46
		Evening	28.9	10.4	2.4	0.7	0.2		
		Night	18.3	7.0	1.9	0.8	0.4		
3	Unity Church	24 Hour Day	66.0	6.0	1.0	0.0	0.0	70	38
		Evening	12.2	1.1	0.2	0.0	0.0		
		Night	5.4	1.0	0.2	0.0	0.0		
4	Andover School	24 Hour Day	152.0	40.0	0.0	0.0	0.0	57	22
		Evening	27.4	7.5	0.0	0.0	0.0		
		Night	15.2	2.8	0.0	0.0	0.0		
5	Holy Trinity School	24 Hour Day	113.0	28.0	3.0	1.0	0.0	71	38
		Evening	20.1	5.0	0.5	0.2	0.0		
		Night	13.6	3.5	0.7	0.3	0.0		
6	Faith Church	24 Hour Day	62.0	9.0	0.0	0.0	0.0	63	29
		Evening	11.0	1.5	0.0	0.0	0.0		
		Night	7.1	1.3	0.0	0.0	0.0		
7	Point Pleasant School	24 Hour Day	52.0	12.0	0.0	0.0	0.0	66	33
		Evening	9.3	2.1	0.0	0.0	0.0		
		24 Hour Day	6.1	1.8	0.0	0.0	0.0		

TABLE A-13 (CONT)

BALTIMORE-WASHINGTON INTERNATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

EXISTING CONDITIONS (1976)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
8	Queenstown School	24 Hour Day	154.0	37.0	4.0	0.0	0.0	69	35
		Evening	27.6	6.7	0.7	0.1	0.0		
		Night	16.0	3.5	0.4	0.1	0.0		
9	Glen Burnie School	24 Hour Day	116.0	19.0	2.0	0.0	0.0	70	38
		Evening	21.0	3.3	0.3	0.0	0.0		
		Night	11.4	2.4	0.3	0.0	0.0		
10	North Arundel Hospital	24 Hour Day	90.0	10.0	0.0	0.0	0.0	62	28
		Evening	16.1	1.7	0.0	0.0	0.0		
		Night	9.4	1.0	0.1	0.0	0.0		

TABLE A-14

BALTIMORE-WASHINGTON INTERNATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

NO POLICY CHANGE (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
1	Waterloo School	24 Hour Day	106.5	3.5	0.0	0.0	0.0	60	25
		Evening	18.1	0.6	0.0	0.0	0.0		
		Night	13.9	0.4	0.0	0.0	0.0		
2	St. Mark's School	24 Hour Day	297.7	123.7	38.3	15.7	6.1	81	45
		Evening	52.4	21.9	6.7	2.7	1.1		
		Night	38.3	16.0	5.1	2.1	0.8		
3	Unity Church	24 Hour Day	167.0	41.4	6.1	0.1	0.0	69	34
		Evening	29.2	7.4	1.0	0.0	0.0		
		Night	22.0	5.3	0.8	0.0	0.0		
4	Andover School	24 Hour Day	133.6	6.5	0.0	0.0	0.0	59	24
		Evening	23.0	1.1	0.0	0.0	0.0		
		Night	17.1	0.9	0.0	0.0	0.0		
5	Holy Trinity School	24 Hour Day	97.2	22.5	3.7	2.1	0.7	72	36
		Evening	17.1	4.0	0.6	0.4	0.1		
		Night	12.7	2.9	0.5	0.3	0.1		
6	Faith Church	24 Hour Day	55.7	7.7	0.7	0.0	0.0	61	26
		Evening	9.7	1.3	0.1	0.0	0.0		
		Night	7.3	1.0	0.1	0.0	0.0		
7	Point Pleasant School	24 Hour Day	44.8	7.6	0.5	0.0	0.0	61	26
		Evening	7.8	1.3	0.1	0.0	0.0		
		24 Hour Day	5.9	1.0	0.1	0.0	0.0		

TABLE A-14 (CONT)

BALTIMORE-WASHINGTON INTERNATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

NO POLICY CHANGE (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
8	Queenstown School	24 Hour Day	168.6	20.2	4.0	1.1	0.1	71	35
		Evening	29.5	3.5	0.7	0.2	0.0		
		Night	22.5	2.7	0.5	0.1	0.0		
9	Glen Burnie School	24 Hour Day	174.1	53.0	4.7	0.1	0.0	70	36
		Evening	31.1	9.5	0.8	0.0	0.0		
		Night	23.1	7.0	0.6	0.0	0.0		
10	North Arundel Hospital	24 Hour Day	67.5	6.9	0.8	0.0	0.0	62	27
		Evening	11.8	1.2	0.2	0.0	0.0		
		Night	8.9	0.9	0.1	0.0	0.0		

TABLE A-15

BALTIMORE-WASHINGTON INTERNATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

CONTROLLED GROWTH POLICY TO 18 MILLION PASSENGERS AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
1	Waterloo School	24 Hour Day	111.2	3.6	0.0	0.0	0.0	60	25
		Evening	18.8	0.6	0.0	0.0	0.0		
		Night	15.0	0.5	0.0	0.0	0.0		
2	St. Mark's School	24 Hour Day	306.7	127.4	39.7	16.5	6.5	82	46
		Evening	53.5	22.3	6.9	2.8	1.1		
		Night	40.5	16.8	5.4	2.3	0.9		
3	Unity Church	24 Hour Day	173.0	42.4	6.4	0.1	0.0	69	34
		Evening	29.9	7.5	1.1	0.0	0.0		
		Night	23.4	5.6	0.9	0.0	0.0		
4	Andover School	24 Hour Day	139.7	6.9	0.0	0.0	0.0	59	24
		Evening	23.3	1.1	0.0	0.0	0.0		
		Night	18.8	1.0	0.0	0.0	0.0		
5	Holy Trinity School	24 Hour Day	101.4	23.5	3.9	2.3	0.8	73	37
		Evening	17.4	4.1	0.7	0.4	0.1		
		Night	13.7	3.2	0.5	0.3	0.1		
6	Faith Church	24 Hour Day	58.8	8.1	0.7	0.0	0.0	62	27
		Evening	10.0	1.4	0.1	0.0	0.0		
		Night	8.0	1.1	0.1	0.0	0.0		
7	Point Pleasant School	24 Hour Day	47.2	8.1	0.5	0.0	0.0	61	26
		Evening	8.0	1.4	0.1	0.0	0.0		
		24 Hour Day	6.4	1.1	0.1	0.0	0.0		

TABLE A-15 (CONT)

BALTIMORE-WASHINGTON INTERNATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

CONTROLLED GROWTH POLICY TO 18 MILLION PASSENGERS AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
8	Queenstown School	24 Hour Day	177.7	21.6	4.2	1.2	0.1	71	35
		Evening	30.2	3.7	0.7	0.2	0.0		
		Night	24.6	2.9	0.6	0.2	0.0		
9	Glen Burnie School	24 Hour Day	180.1	54.7	5.1	0.1	0.0	70	36
		Evening	31.7	9.7	0.9	0.0	0.0		
		Night	24.2	7.3	0.7	0.0	0.0		
10	North Arundel Hospital	24 Hour Day	71.8	7.4	0.9	0.0	0.0	63	27
		Evening	12.3	1.3	0.2	0.0	0.0		
		Night	9.7	1.0	0.1	0.0	0.0		

TABLE A-16

BALTIMORE-WASHINGTON INTERNATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

CONTROLLED GROWTH POLICY TO 16 MILLION PASSENGERS AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
1	Waterloo School	24 Hour Day	124.8	4.0	0.0	0.0	0.0	60	25
		Evening	21.5	0.7	0.0	0.0	0.0		
		Night	15.6	0.5	0.0	0.0	0.0		
2	St. Mark's School	24 Hour Day	329.3	136.2	43.2	18.6	7.2	82	46
		Evening	57.9	24.1	7.6	3.3	1.3		
		Night	41.5	17.2	5.5	2.4	0.9		
3	Unity Church	24 Hour Day	188.1	45.1	7.2	0.1	0.0	70	35
		Evening	32.8	8.1	1.3	0.0	0.0		
		Night	24.0	5.7	0.9	0.0	0.0		
4	Andover School	24 Hour Day	155.0	7.6	0.0	0.0	0.0	59	24
		Evening	26.0	1.3	0.0	0.0	0.0		
		Night	19.4	1.0	0.0	0.0	0.0		
5	Holy Trinity School	24 Hour Day	109.8	25.4	4.4	2.6	0.8	73	37
		Evening	19.0	4.4	0.8	0.4	0.2		
		Night	14.0	3.2	0.6	0.3	0.1		
6	Faith Church	24 Hour Day	65.0	9.1	0.8	0.0	0.0	62	27
		Evening	11.1	1.6	0.1	0.0	0.0		
		Night	8.3	1.1	0.1	0.0	0.0		
7	Point Pleasant School	24 Hour Day	52.0	9.0	0.5	0.0	0.0	62	27
		Evening	9.0	1.5	0.1	0.0	0.0		
		24 Hour Day	6.6	1.1	0.1	0.0	0.0		

TABLE A-16 (CONT)

BALTIMORE-WASHINGTON INTERNATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

CONTROLLED GROWTH POLICY TO 16 MILLION PASSENGERS AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
8	Queenstown School	24 Hour Day	195.5	24.2	4.8	1.3	0.1	71	35
		Evening	33.6	4.2	0.9	0.2	0.0		
		Night	25.2	3.0	0.6	0.2	0.0		
9	Glen Burnie School	24 Hour Day	192.0	57.7	5.8	0.1	0.0	71	36
		Evening	34.1	10.4	1.0	0.0	0.0		
		Night	24.8	7.4	0.7	0.0	0.0		
10	North Arundel Hospital	24 Hour Day	80.4	6.2	1.0	0.0	0.0	63	28
		Evening	13.8	1.4	0.2	0.0	0.0		
		Night	10.2	1.1	0.1	0.0	0.0		

TABLE A-17

BALTIMORE-WASHINGTON INTERNATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

REDUCED ACTIVITY POLICY AT NATIONAL (1990)

			Time (Minutes) Above Indicated dBA Level						
Site No.	Description	Period	65	75	85	90	95	Ldn	NEF
1	Waterloo School	24 Hour Day	129.3	4.3	0.0	0.0	0.0	60	26
		Evening	22.3	0.7	0.0	0.0	0.0		
		Night	16.3	0.6	0.0	0.0	0.0		
2	St. Mark's School	24 Hour Day	336.5	139.0	44.4	19.4	7.7	82	46
		Evening	59.5	24.7	7.8	3.3	1.3		
		Night	42.4	17.5	5.7	2.6	1.0		
3	Unity Church	24 Hour Day	192.6	46.0	7.6	0.2	0.0	70	35
		Evening	34.1	8.3	1.3	0.0	0.0		
		Night	24.7	5.9	1.0	0.0	0.0		
4	Andover School	24 Hour Day	159.1	7.9	0.0	0.0	0.0	60	24
		Evening	27.6	1.4	0.0	0.0	0.0		
		Night	19.8	1.0	0.0	0.0	0.0		
5	Holy Trinity School	24 Hour Day	112.3	25.9	4.6	2.7	0.9	73	37
		Evening	19.8	4.6	0.8	0.5	0.2		
		Night	14.3	3.3	0.6	0.4	0.1		
6	Faith Church	24 Hour Day	66.8	9.4	0.8	0.0	0.0	62	27
		Evening	11.7	1.6	0.1	0.0	0.0		
		Night	8.5	1.2	0.1	0.0	0.0		
7	Point Pleasant School	24 Hour Day	53.4	9.3	0.6	0.0	0.0	62	27
		Evening	9.3	1.6	0.1	0.0	0.0		
		24 Hour Day	6.8	1.2	0.1	0.0	0.0		

TABLE A-17 (CONT)

BALTIMORE-WASHINGTON INTERNATIONAL AIRPORT

NOISE LEVELS AT REPRESENTATIVE SITES RESULTING FROM AIRCRAFT OPERATIONS

REDUCED ACTIVITY POLICY AT NATIONAL (1990)

Site No.	Description	Period	Time (Minutes) Above Indicated dBA Level 65	75	85	90	95	Ldn	NEF
8	Queenstown School	24 Hour Day	201.5	25.0	5.0	1.4	0.1	71	35
		Evening	35.3	4.3	0.9	0.2	0.0		
		Night	25.8	3.2	0.7	0.2	0.0		
9	Glen Burnie School	24 Hour Day	195.8	58.7	6.2	0.2	0.0	71	36
		Evening	34.7	10.4	1.0	0.0	0.0		
		Night	25.4	7.6	0.8	0.0	0.0		
10	North Arundel Hospital	24 Hour Day	83.5	8.4	1.0	0.0	0.0	63	28
		Evening	14.3	1.5	0.2	0.0	0.0		
		Night	10.7	1.1	0.1	0.0	0.0		

APPENDIX B

AIR QUALITY

TABLE B-1

ASSUMPTIONS & SOURCES FOR NON-AIRPORT RELATED AIR QUALITY DATA AT WASHINGTON NATIONAL AIRPORT

	1979	1980
*Carbon Monoxide		
Eight Hour	8.6 - 1.2 = 7.4 ppm Aurora Hills (monitored 1979)	1.7 ppm and 5.2 ppm 1985 and 1995 COG Report (March 1977) Figures 28 and 29.
One Hour	12.5 - 1.75 = 10.8 ppm Aurora Hills (monitored 1979)	2.6 ppm and 7.8 ppm Estimated from eight-hour data
Hydrocarbons		
6 - 9 a.m.	2.5 - 0.097 = 2.403 ppm CAMP Station (monitored 1976)	1.883 ppm Estimated from existing data
Nitrogen Dioxide		
Annual	0.030 - 0.008 = 0.022 ppm Aurora Hills (monitored 1979)	0.032 ppm Estimated from existing data
*Suspended Particulates		
24-Hour Average	136 - 3.55 = 132.5 $\mu g/m^3$ Aurora Hills (monitored 1979)	137 $\mu g/m^3$ and 208 $\mu g/m^3$ Estimated from existing data
Annual Geometric Mean	49 - 0.65 = 48.4 $\mu g/m^3$ Aurora Hills (monitored 1979)	50 $\mu g/m^3$ and 75 $\mu g/m^3$ 1985 and 1995 COG Report (March 1977) Figures 24 and 25.

*The range of values for the 1990 carbon monoxide and suspended particulates levels is presented to reflect the variation between the 1985 and 1995 levels contained in the COG report. 1990 is an interim year between the two baseline cases and, as such, is incorporated to yield the values presented.

TABLE B-2

ASSUMPTIONS & SOURCES FOR NON-AIRPORT RELATED AIR QUALITY DATA AT DULLES AIRPORT

	1979	1980
Carbon Monoxide		
Eight Hour	3.0 ppm Dulles EIS Master Planning Report September 1977	1.8 ppm Dulles EIS Master Planning Report September 1977
One Hour	4.7 ppm Dulles EIS Master Planning Report September 1977	2.9 ppm Dulles EIS Master Planning Report September 1977
Hydrocarbons		
6 - 9 a.m.	2.10 - 0.019 = 2.081 ppm Sterling Park (monitored 1976)	1.85 ppm Estimated from existing data
Nitrogen Dioxide		
Annual	0.011 - 0.004 = 0.007 ppm Cub Run (monitored 1979)	0.007 ppm Estimated from existing data
Suspended Particulates		
24-Hour Average	124 - 0.2 = 123.8 $\mu g/m^3$ Herndon (monitored 1979)	115 $\mu g/m^3$ Estimated from existing data
Annual Geometric Mean	54 - 0.1 - 53.9 $\mu g/m^3$ Herndon (monitored 1979)	50 $\mu g/m^3$ COG Report (March 1977) Figures 24 and 25

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